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ON JEFFERSONIA DIPHYLLA. (TWIN LEAF—RHEUMATISM ROOT.)

By Edward S. Wayne.

Nat. Ord.—Berberidaceæ. *Sex. Syst.*—Octandria monogynia.

The Jeffersonia diphylla is a herbaceous annual plant; the scape or stem is naked, from eight to fourteen inches high; the leaves are in pairs, binate, placed base to base; oval broader than long, ending in an obtuse point, smooth, glaucous beneath, and on petioles as long as the scape, which arise from the rhizoma. The flowers are large, regular, white. The calyx consists of four deciduous sepals. Stamens eight, with oblong linear anthers on slender filaments. Ovary ovoid, soon gibbous, pointed; stigma two lobed. The capsule is obovate, stipitate, one celled, opening half way round horizontally, making a persistent lid. Seeds many on the lateral placenta, with a fleshy lacerate aril, on one side, oblong. (I am indebted to the American Eclectic Dispensatory for the botanical description of this plant.)

The root, which is the part used, is a thick, knotty, rhizoma, from which long fibrous roots proceed; it is of a brownish yellow color. The epidermis is somewhat corrugated, and in some specimens transversely cracked. The bark is resinous, and contains the active principles of the root. The central portion is ligneous, of a light straw color, and possesses little or none of the bitter acrid taste of the bark, from which it is easily separated by bruising the root. The root, when chewed, has a bitter mucilaginous taste at first, but after a short time an acrid taste, leaving a peculiar irritating sensation in the fauces, similar in some respects to senega. This plant is indigenous to North America, is found in New York, Maryland, and in Virginia, and in many parts of the Western States. My attention has been at-

tracted to this article for some time past, by many encomiums I have heard upon it by physicians of the Eclectic school, as an expectorant and tonic, possessing properties similar to those of senega, which article has become so scarce of late in our market, and consequently high in price, I have been induced, with the view of substituting for it, or bringing into notice and use, an article of similar medicinal properties, which can be obtained plentifully, at a much less price, to make an examination of the chemical constituents of this plant, by means of a proximate analysis.

Chemical Examination.—One thousand grains of the root in coarse powder was macerated with water for twelve hours; then placed in a percolator, and half a pint of liquid obtained; it was of a dark sherry color, slightly bitter and acid to the taste, (but not as acrid or irritating as the root when chewed.) The presence of albumen in this infusion was indicated by its coagulating upon being heated, and yielding precipitates upon the addition of a solution of tannic acid and corrosive sublimate.

Tannin.—Solutions of tartar emetic and gelatin produced no change in the infusion. Sesqui salts of iron produced a marked difference in it, changed the solution to a dark olive green color, unchanged by heating it, and in the course of a short time gave a precipitate of an olive green color, indicating that the color produced by the addition of the sesqui salts of iron was not owing to the presence of gallic acid, but to the presence of a modified tannic acid, which strikes a green color with iron.

Gum.—A portion of the infusion freed from tannic and coloring matter by neutral acetate of lead, gave, upon the addition of basic acetate of lead, a precipitate of gummy matter.

Starch.—A portion of the dregs left in the percolator, was boiled with water, to the filtered liquid tincture of iodine was added, which struck the deep blue color, characteristic of the presence of starch.

Pectin.—The remaining portion of the dregs left was heated for some time with a dilute solution of carb. soda, the liquid filtered off, which upon the addition of chlorohydric acid produced a gelatinous precipitate, pectic acid.

Fatty Resin.—Five hundred grains of the root in coarse powder

was digested with ether for some time, and then placed in a percolator, and about eight ounces of tincture obtained; it was of a dark green color, of a disagreeable astringent taste, and left a permanent greasy stain on paper. A portion of it was soluble in water, the solution gave, with sesqui salts of iron, an olive green color and precipitate, indicating the presence of tannin.

One thousand grains of the root in coarse powder was digested in water for twelve hours, and then placed in a percolater, and water added until thirty two ounces of infusion was obtained; the infusion was of a pale brown color, possessing the odor of the root, and a peculiar acrid taste. Neutral acetate of lead was added as long as it produced a precipitate, and afterwards sub-acetate of lead. The excess of lead being carefully removed by the cautious addition of sulphuric acid, the sulphate of lead was filtered out of the infusion. The liquid was then carefully evaporated to a syrupy consistence (about two ounces remaining); it was to the taste slightly bitter, with none of the acridity of the original infusion. After standing for a day or two, a slight granular precipitate formed at the bottom of the dish: the precipitate was removed and washed with alcohol, in which it was insoluble, also in water, and upon examination was found to be a salt of lime, probably sulphate. The liquid from which the crystals were removed was then evaporated to the consistency of an extract, and treated with boiling alcohol, which dissolved a portion of it, and which was set aside to evaporate spontaneously; upon cooling it assumed a clouded appearance, and left, upon evaporation, a muddy deposite, evincing no disposition to assume a crystalline form. The portion left after treatment with alcohol dissolved readily in water; it had a sweet, slightly bitter taste; evaporated and heated strongly it was decomposed, emitted the peculiar odor of burnt sugar, and like it dissolved in water with a deep brown color.

5000 grains were digested with alcohol for twelve hours, and then thrown into a percolator, and thirty-two ounces of tincture obtained; it was of a dark color, and possessed the peculiar taste of the root to a much greater degree than the former infusion; it was evaporated to a syrupy form and then thrown into warm water, which caused a separation of resin and fatty matter, which was

separated by filtration. To the filtered liquid, hydrochloric acid was added, which caused a slight precipitate to fall; it was separated and washed on the filter, and dissolved in boiling alcohol, from which it separated on cooling, and upon the evaporation of the alcohol assumed an amorphous shape. The amount obtained was so small that I had not sufficient of it to examine it as I should have wished, and shall take another opportunity of examining it; it had a peculiar bitter taste, was soluble in water and also in boiling alcohol, from which it was deposited upon cooling.

I deemed it useless to make any further search for an alkaline principle, aware that of plants of the order Berberidaceæ, so far as they have been examined, none has been found, unless berberine may be classed as such, which is doubtful; it forms compounds with acids, (not true salts,) soluble with difficulty. I consequently turned my investigations to the isolation of the peculiar acrid principle of the plant, upon which its medicinal properties depend, and some further investigation of its peculiar tannic acid. And with this view 5000 grains of the root were digested with alcohol for twenty-four hours, then placed in a percolator and treated with alcohol until it passed almost tasteless; the tincture was of a dark brown color, it was evaporated to a syrupy form, and water added; the fatty and resinous matter separated by filtration; to the filtered liquid neutral acetate of lead was added as long as it produced a precipitate; the precipitate was collected on a filter, washed, and decomposed under alcohol by sulphuretted hydrogen, the liquid heated to expel the excess, and filtered to separate the lead. In its behaviour with re-agents it gave the same results as the tannic acid of Asperula odorata, which has been examined by R. Schwartz, (see Chem. Gaz., No. 224,) and strikes with sesqui salts of iron a dark green color; alkalies cause the liquid to assume a brown red color, which by exposure and absorption of oxygen becomes finally opaque and blackish brown. Albumen, gelatin and tartar emetic produced no precipitates. Peroxide of copper caused a dark green color, and both the neutral and the basic lead salts caused yellow precipitates. I would here take the occasion to ask the question is not the appellation of tannic to acids of the behaviour to reagents mentioned a misnomer? The most characteristic reaction of tannic acid is that of forming a precipitate with gelatin, or of combining with it in the process of tanning, forming leather. We

have at present a number of astringent acids called tannic, which, like gallic acid, produce no precipitates with gelatin, nor combine with it. Would it not be more appropriate, and give a better idea of their reactions, to style them gallic, instead of tannic acids ?

Another portion of 5000 grains was treated like the former, *i. e.* a tincture made and evaporated to the consistency of a syrup, and treated as in the preparation of polygalic acid. It was washed well with ether to remove tannic acid, and then dissolved in water and filtered ; to the filtrate, solution of subacetate of lead was added in excess, the precipitate collected on a filter and washed with water. The precipitate suspended in water was decomposed by means of sulphuretted hydrogen, filtered from the sulphuret of lead, the solution evaporated, and the extract exhausted with spirits, and evaporated. The mass left after evaporation was of a light yellow color, transparent, and easily pulverizable, soluble in water, soluble in alcohol, from which solution it was precipitated by the addition of ammonia, and yields precipitates with metallic salts. To the taste it was acrid and nauseous. I have tried the effects of its administration upon myself with decidedly unpleasant results ; both times I tried it, it produced vomiting and a sensation of nausea for some time after. It is, I presume, the acrid principle of the root, and in some of its properties, as far as my knowledge extends, it is similar to polygalic acid, as described in the various works on materia medica.

Both the watery infusion and alcoholic tincture of this root possess, to a very great degree, the property of frothing upon agitation, or upon being poured from one vessel to another. In this respect it resembles senega ; and the isolated acrid principle in solution has this property, which is also characteristic of polygalic acid and saponin, a principle obtained from Saponaria officinalis.

The resin left upon the filter, in the examination of the tannic acid, was well washed with water ; in the finely-divided nascent state it was of a light yellow color, and bland to the taste. In drying, the mass contracted very much, and assumed a dark brown color, and a resinous fracture. It was perfectly soluble in alcohol.

From the above experiments upon the root of this plant, its organic constituents found are, albumen, gum, tannic acid, of the

kind that yields no precipitates with solutions of gelatin and tartar emetic, and produces, with sesqui salts of iron a green color, starch, pectin, fatty-resin, resin, sugar, lignin, a peculiar acrid acid resembling polygalic acid, and a bitter principle which I have not had time to examine fully.

Inorganic Constituents.—2000 grains of the bark in coarse powder were partially incinerated in a Hessian crucible, then transferred to a platina one and the incineration completed. Fifty-three grains of ash were obtained. The ash was treated with boiling distilled water as long as it dissolved any portion of it, and the solution then evaporated to dryness, redissolved in water and neutralized with nitric acid, with evolution of carbonic acid.

A portion of the solution was then evaporated to dryness; it had the cooling taste of nitrate of potassa, and deflagrated upon being thrown upon glowing coal. The remainder of the solution was then treated with tartaric acid, which caused a white crystalline precipitate; bichloride of platina produced a yellow deposite, and nitrate of baryta a white precipitate insoluble in nitric acid. These tests indicating that the soluble portion of the ash contains both carbonate and sulphate of potassa.

The insoluble portion of the ash was now treated with dilute hydrochloric acid, the greater portion of the ash was dissolved, with escape of carbonic acid. The solution was filtered, and the insoluble portions upon the filter washed with water. The solution was then evaporated to dryness and dissolved in water. Oxalate of ammonia was added to a portion of it, which threw down a white precipitate of oxalate of lime. Sulphuric acid also threw down a white precipitate, sulphate of lime. To another portion ferrocyanide of potassium, which gave the characteristic blue color indicating the presence of iron. To the remaining portion phosphate of soda was added, which gave the solution an opaque appearance; upon the addition of ammonia to it, a white precipitate was produced, indicating the presence of magnesia.

The insoluble portion of the ash left after treatment with dilute hydrochloric acid was then treated with strong hydrochloric acid, with heat. A small portion of the ash was left undissolved, silica. To the solution ammonia was added, sufficient to neutralize it, and then acetic acid; a gelatinous precipitate formed of

phosphate of sesqui oxide of iron, which was separated, dissolved in muriatic acid from which potassa in excess threw down a red precipitate, sesqui oxide of iron.

The analysis of this root shows that its chemical composition is somewhat similar to that of senega, and its sensible properties are somewhat analogous: like it, it possesses an acrid principle (the identity of which I do not pretend to say) upon which its expectorant property depends; it is, in large doses, emetic, and also has tonic properties. It has been used to some extent in place of senega with satisfactory results, by physicians of the Eclectic school.

Senega, like many other of our indigenous medicines, is becoming every year much scarcer. In localities from which, a few years since, we received a large amount, the plant has become so scarce that it will not pay to collect it. If some other plant possessing similar properties could be substituted for it, the Jeffersonia for instance, it would reduce the demand for senega, and allow some opportunity for its increase. As it is, a few years demand for it will, in all probability, make the article so scarce in our markets, and consequently so high in price, that it will be but little used, and in this view I think the Jeffersonia is worthy of the attention of the medical profession.

Cincinnati, Nov., 1852.

ON TEXAS SARSAPARILLA.

(*Menispermum Canadense.*)

By Robert P. Thomas, M. D.

In the January number of this Journal for 1844, an account is given by Dr. Joseph Carson, of an article that had recently been brought from New Orleans, and offered for sale in this city, under the name of Texas Sarsaparilla. The following is the description of the article in question. "The packages have been made to resemble those of the genuine, about a foot and a half in length, and half a foot or more in diameter; composed of long branching stems, doubled twice or thrice upon themselves, without any attachment to a head. The lower portion of the stem is as thick as a large sized quill, rough, wrinkled longitudinally, and of a dirty brown color; the upper extremely thin, smooth and light brown

At irregular intervals of their length, are protuberances from which lateral branches appear to have been separated; and along the entire under surface of the older and lower portions are minute fibrillæ, here and there collected in small tufts. The structure of this article is evidently cauline, consisting of a delicate epidermis, and a thin woody layer, very tough and fibrous, enclosing medulla."

The timely publication of the foregoing description, has probably prevented the further introduction of this drug as a substitute for the true sarsaparilla, since but a single importation has been made.

The real source of the article remained in question, until an accidental circumstance, which occurred during the past summer, threw some light upon it.

A member of the Pharmaceutical class, Mr. J. Clarkson Griffith, resolved upon analyzing, as the subject of his Thesis, the root of a plant found growing in great abundance in Virginia; and said to be used by many rural practitioners there as a substitute for sarsaparilla.

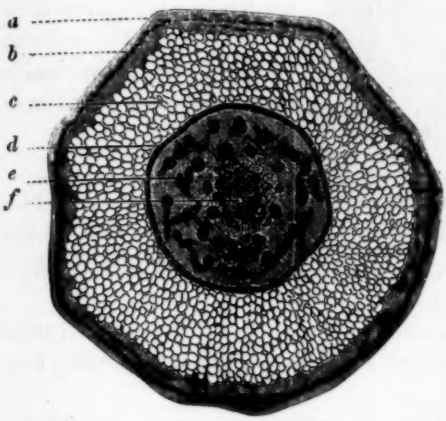
Having received from his friends a package of the roots, containing a few leaves, (but no flowers or fruit,) it was submitted to my inspection to determine the name of the plant. From the peculiar shape of the leaf, its sub-coriaceous and peltate character, and the insertion of the petiole near the margin, I had no difficulty in recognizing it as belonging to the Menispermum Canadense, (Moon Seed or Yellow Root.) But as I was struck with the close resemblance between the root and the specimen of Texas Sarsaparilla deposited in the College cabinet, I procured some of the fresh plant and root with a view of instituting a microscopical comparison, and determining, if possible, the true source of the Texas Sarsaparilla.

When the root is freshly-gathered, it is round, smooth, of a bright yellow color, and affords origin to numerous radicles. But after desiccation, it is wrinkled longitudinally, assumes a darker hue, and ultimately becomes brown. It is without odor, the taste is quite bitter and disagreeable. The root is a rhizome or underground stem, but so clearly resembles an aerial one in its structure as to be readily mistaken for the latter. It is divisible into a bark, cortical layer, ligneous fibres, and medulla or pith.

The first point in the inquiry about to be instituted, is to determine that the Texas is not a true sarsaparilla; and the second, to ascertain its identity with the common moon seed, or Menispermum Canadense.

To resolve the first question, we must examine the structure of the true sarsaparilla, (smilax,) and learn what are its component parts, and how they are arranged.

Fig. 1.



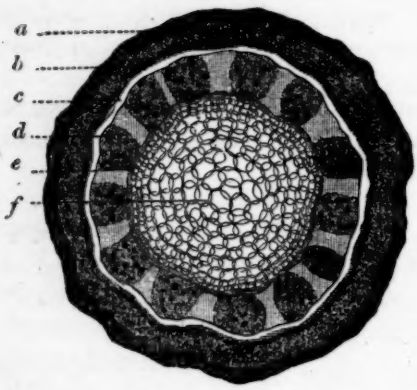
The accompanying wood-cut, (Fig. 1,) is a highly magnified representation of the appearance presented by a transverse section of Para sarsaparilla. It exhibits a very close resemblance to the diagrams of Honduras and Jamaica sarsaparillas given in Pereira's Materia Medica; thereby showing that neither differences in the mere species of plants, nor yet in the character of the soil and climate where they are produced, effect any very decided changes in their internal structure.

At *a* is seen the thin epidermis, covering *b* the outer cortical layer; *c* is the inner cortical or starchy layer; *d* is the cellular sheath dividing the cortical from the woody layer *e*, in which the cut orifices of numerous ducts and fibres are observed; *f* the central pith.

In this, as in the false sarsaparilla represented below, the four divisions of bark, cortical layer, ligneous fibres and pith are seen. But nothing like a medullary ray (or the silver-grain, as it is usually termed in the stems of plants,) is to be observed. Owing to the presence of the ligneous fibres, represented in section in the woody zone *e*, the true sarsaparilla readily splits in the longitudinal direction.

Figure 2 presents a cross section of the Texas Sarsaparilla which differs in its whole structure from the genuine.

Fig. 2.



a, the epidermis; *b*, the outer cortical layer; *c*, the liber or inner bark; *d*, a zone of ligneous fibres, which are separated from each other by a medullary deposit, the dark spots are the ducts which have been cut across; *e*, the cellular sheath dividing the woody zone from *f*, the medulla or pith.

When the end of the dried root is bruised, it separates into a brush, consisting of the ligneous fibres of the zone *d*. The appearance presented is entirely different from the simple longitudinal splitting of the true sarsaparilla.

The structure of this rhizome is evidently that of an aerial stem, containing bark, wood and pith; with medullary rays passing from the pith to the bark.

An examination of these figures affords us conclusive evidence of the structural difference between the true and false sarsaparillas, and thus determines the first point in the inquiry.

To resolve the second, or in other words, to ascertain, if possible, from what plant the Texas Sarsaparilla was derived, I examined, microscopically, the root of the plant brought from Virginia, (which I judged to be the Menispermum Canadense from the nature of its leaf,) and found it to correspond in every particular with the representation given in figure 2.

The next examination was of a specimen of "yellow parilla," the name given to the root of the Menispermum Canadense by the Eclectics; and this, also, coincided in its characteristics with those shown in figure 2.

Lastly, I procured fresh specimens of the root, which upon inspection exhibited similar appearances. In fact, I could detect no structural differences between the Texas Sarsaparilla, the Virginia Sarsaparilla, the "yellow parilla," and the fresh root of the

Menispermum Canadense, when sections of each were placed on the field of the microscope. The conclusion was irresistible to my mind, that the so-called Texas Sarsaparilla is the root of the common moon seed or Menispermum Canadense.

Philadelphia, Nov. 1854.

ON THE ADVANTAGES THAT WOULD ACCRUE TO ENGLISH AND AMERICAN PHARMACY BY THE ADOPTION OF A SINGLE UNIFORM PHARMACOPŒIA FOR THE BRITISH EMPIRE.*

By Franklin Bache, M. D.

Professor of Chemistry in Jefferson Medical College of Philadelphia.

A difficulty which medical students have to contend with, and which is the more to be regretted, because it does not necessarily attach to science, is to be found in the numerous synonymes in use in the various sciences connected with medicine. We have them in botany, in chemistry, in the materia medica, and especially in the nomenclature of pharmaceutical preparations. The pharmacy of this country, before the year 1820, when our first national Pharmacopœia was published, was derived from Great Britain, which furnished us with three standards of pharmaceutical preparations; namely, the London, Edinburgh and Dublin Pharmacopœias, emanating from the Colleges of Physicians of those cities. In that year, our national Pharmacopœia came into use as a standard; and by its several revisions in 1830, 1840 and 1850, it has been rendered more and more acceptable to the medical and pharmaceutical professions. Still, our national work could not be expected entirely to supersede the British Pharmacopœias; and, accordingly, it will be found that all the Dispensatories, published in this country since 1820, have not only elucidated the United States Pharmacopœia, but included a commentary on the British works. The course, thus taken by commentators, was a proper one. Our national Pharmacopœia could not be expected to include the whole of the materia medica and preparations of the British standards, a part of the matter of the three works being peculiar to each; and yet the articles omitted deserved to be commented on by our pharmacologists, either on account of their lingering

*Extracted from an unpublished introductory lecture, delivered Oct. 12, 1854.

reputation, or in view of their being frequently referred to in valuable medical works of English, Scotch and Irish authors. So long, therefore, as we give the attention to the medical literature of Great Britain that it deserves, we must make ourselves acquainted with the officinal medicines and preparations, stamped as of value by the authority of her Colleges; otherwise her medical writers would be, to some extent, unintelligible to us. It is thus clearly shown that we are necessarily interested in British pharmacology, and in those meliorations of which it is undoubtedly susceptible. But the pharmacology of Great Britain is mainly embodied in her three Pharmacopœias, each emanating from an authoritative body; while, evidently, there should be but one standard for the whole British empire. The evil of this want of uniformity is put in a striking point of view, by supposing that each State of our union had a separate Pharmacopœia; but the evil is the same in kind, only less in degree, that a separate Pharmacopœia is recognized, severally, in England, Scotland and Ireland.

By the more enlightened nations of continental Europe, the interests connected with the preparation of medicines are better guarded; as in France, for example, where but one standard of pharmacy is allowable by law for the whole empire; and this standard is the result of the joint labours of a commission of physicians and pharmaceutists, appointed by the government. The evil of the British system is admitted by British medical writers; and the reform is delayed, not because it is deemed unnecessary, but because the Colleges cannot agree upon a single standard, chiefly on account of their local prejudices and mutual jealousies. The British Pharmacopœias contain a body of identical or equivalent medicines and preparations, which form the common basis of the three works. In relation to these medicines and preparations, it would be necessary to agree upon a uniform nomenclature, and upon uniform formulas. This agreement being effected, it would next be a question in relation to the medicines and preparations peculiar to any two or any one of the Colleges; and the nomenclature and formulas of these should be made to conform in principle with those of the common basis. No College could reasonably object to the retention of any medicine or preparation, advocated by any other College; because, although the article may be uncalled for in the

region under the influence of the objecting College, still it would be merely surplusage to such College; while it might be necessary to meet the wants of the physicians in the region under the influence of the advocating College. The prejudices and conflicting interests, shadowed forth in these remarks, would make it extremely difficult, not to say impossible, to get the British Colleges to agree on all points in relation to a common standard. The most that could be expected from them, would be to settle the general principles of the work, and to take some steps of detail in the right direction. To make a final disposition of the subject, it would, no doubt, be necessary that the law should interpose; and that, by authority of an act of parliament, a commission of eminent men should be clothed with full power to dispose of all outstanding questions, and to complete the desired standard. If a course, somewhat like that here indicated, were taken, the advantage would accrue to medical science of having not merely one, instead of three British Pharmacopœias; but of having the elaborated work incomparably superior to those it would supersede. Many anomalies and inconsistencies of British pharmacy would disappear; dangerous variations in the strength of officinal solutions of the salts of morphia would no longer exist; and those glaring defects in nomenclature, consisting in calling the same preparation by different names, and different preparations by the same name, would be removed. Our national Pharmacopœia would feel the benefit of such a reform; for, without doubt, if such a Pharmacopœia of the British empire were published, all the new and valuable parts of it would be incorporated into our national standard on its next revision in 1860. Nor is this all. Our physicians and medical students would feel the benefit of the reform. British medical works would employ a uniform nomenclature for medicines; and our Dispensatories would be relieved from a number of discordant formulas, and from a load of useless synonymes, which at present form a most discouraging obstruction to the progress of the student.

ON A SUBSTITUTE FOR TAR BEER.

By B. J. Crew.

Having, in common with many Pharmaceutists, experienced considerable difficulty in procuring at once both a neat and reliable

preparation of tar, by the ordinary formula for Tar Beer, I was induced to try another more expeditious and much less troublesome and disagreeable mode, than the old plan of using bran, honey and some ferment, and having, as I think, entirely succeeded, I have been induced to make the formula known for the benefit of others.

℞.	Ol. picis liquidæ.	ʒij.
	Magnesiæ carb.	℈ij.
	Aquæ,	℥xiv.
	Syrup simp.	ʒij.

Rub the oil of tar with the carbonate, add a portion of the water, mix well, then add the balance, filter and add the simple syrup. It is now ready for use, and may be taken in the usual dose of a small wineglassful. As thus made, it has given, as far as I am aware, entire satisfaction, having been in use for several years.

[Note by the Editor.—The above preparation is an elegant substitute for *Tar Water*, but can hardly be considered as a correct substitute for tar beer, inasmuch as other substances besides those contained in oil of tar are taken up; the acetic acid present in tar aids in the solution of the kreasote in this preparation of the beer, whilst a portion of alcohol in the latter adds materially to the solvent action of the menstruum, if the preparation is properly made as described at page 110, vol. 22d, of this Journal.]

REMARKS ON GUM MEZQUITE—A VARIETY OF GUM DISCOVERED BY DR. GEORGE G. SHUMARD, IN NORTHERN TEXAS.

By Willliam Procter, Jr.

For several months past occasional notices have appeared in the newspapers of a species of gum discovered in upper Texas and New Mexico by Dr. Shumard, one of Capt. Marcy's expedition to the Indian country, sent by Government. The following letter from Dr. Shumard, accompanying a package of the gum, will throw some light on the subject:

Fort Smith, Arkansas, Oct. 24, 1854.

Dear Sir,—Along with this I send you a sample of gum *mezquite*, discovered by myself while upon our late exploration to the head waters of the Big Witchita and Brazos Rivers.

The mezquite tree, from which it was obtained, is by far the most abun-

dant tree of the plains, and covers thousand of miles of surface. From them the gum exudes spontaneously in a semi-fluid state, and hardens in a few hours, forming more or less rounded lumps of various shades of color, and weighing each from a few grains to several ounces. These soon bleach and whiten by exposure to the light of the sun, finally becoming semi-transparent, and often filled with minute fissures.

The quantity yielded by each tree varies from an ounce to three pounds, but incisions made in the bark not only greatly facilitates its exudation, but causes the tree to yield a much greater amount. The gum may be collected during the months of July, August and September, but the most favorable period for that purpose is in the latter part of August, when it may be obtained in the greatest abundance and with but little trouble. By proper care and attention, I am of the opinion that a sufficient quantity may be annually obtained not only to supply the home market, but to admit of a large surplus for exportation. I have employed the gum medicinally in several instances, and find it answers the purpose of the best gum acacia; with water it forms a beautiful mucilage, while for a proof of its great tenacity I will refer you to this package with which it is sealed. I would be pleased to hear from you upon the subject.

Respectfully yours,

GEO. G. SHUMARD, M.D.

Surgeon and Geologist to Capt. R. B. Marcy's Expedition to Brazos and Witchita Rivers.

To CHARLES ELLIS, President of the Philada. College of Pharmacy.

Dr. Shumard, in a letter to Hon. Thos. S. D. Drew, of the Indian Agency, uses the following language, viz:

"SIR,—I cheerfully comply with your request to furnish, for the use of the Indian Department, a short description of the gum mesquite, discovered during our recent expedition to the head waters of the Big Wachita and Brazos rivers.

"This gum, for which I propose the name of gum *mezquite*, is believed to occur in inexhaustible quantities, and will no doubt prove a source of revenue to the State of Texas, New Mexico and the adjacent Indian territory, besides affording employment to the different tribes of Indians now roving upon the plains, many of whom would no doubt be glad to gather and deliver it to the different frontier posts for a very small compensation."

The specimen of gum sent to Mr. Ellis consists of tears of various sizes, and degrees of purity, from colorless to dark amber color. The pieces are much fissured, like the true gum acacia, and even the darkest pieces, when broken, soon exhibit the tendency to crack into fragments. Many of the pieces have particles of bark attached to them. The sp. gravity of the solid lumps is 1·311, which is about the same as that of gum arabic. Put in

contact with water the gum dissolves as completely as the purest gum arabic, without any tendency to swell like cherry gum or tragacanth; and this is true of the dark colored pieces as well as the light, the mucilage being perfectly transparent. The solution has a slightly acid reaction; alcohol precipitates it in white flocks like arabin; neither neutral or basic acetate of lead alone precipitates it, but on the addition of ammonia after the neutral acetate, a bulky gelatinous precipitate is thrown down. This does not occur when the ammonia is added after the subacetate. When the gum is boiled with an alkaline solution of oxide of copper, no reduction occurs indicative of glucose. When powdered borax is added to its solution no coagulation occurs, as with arabin, nor does tersulphate of iron occasion any precipitate. Oxalate of ammonia instantly causes a white cloud in the transparent solution; iodine occasions no change. Concentrated sulphuric acid dissolves it, and when heated chars it.

When heated in nitric acid till effervescence ceases, it affords mucic and oxalic acids, like ordinary gum; exposed to a red heat it swells up, burns, and leaves a bulky greyish-white ash, amounting to 2.1 per cent. of the gum heated. This ash consists of soluble potash salts, (carbonate, sulphate, and chloride) and insoluble lime salts.

From the above results it is evident that gum *mezquite* is not identical with true gum arabic. Its solubility is quite equal to that gum, and is greater than several varieties, which is an important feature in the American product. The mucilage it yields is like the syrupy mucilage of dextrine, and has similar adhesive properties. In its reactions with nitric and sulphuric acids, with alcohol, and with oxalate of ammonia, it resembles arabin, but in reference to basic acetate of lead, borax, and the sulphate of iron, it is entirely different from arabin or any of the gums described that I am acquainted with.

It is to be regretted that Dr. Shumard has made no allusion to the botanical origin of this gum, a point on which he must certainly have informed himself. There are several species of acacia indigenous to that region, and botanists here believe it is probably attributable to one or more of these. Its abundance and easiness of collection, if corroborated in practice, may prove important hereafter, as an addition to our internal national re-

sources, yet the quality of the gum, as regards freedom from extraneous matter, and color, will have to greatly improve before it will compete with the foreign gum as a medicinal agent. It remains to be seen what effect greater care in collection and garbling, and in subsequent bleaching, will have in its improvement.

Since the above was in print, my friend, E. Durand, informs me that the Mezquite tree of Dr. Shumard, is probably either the Strambo carpa pubescens or screw pod mimosa, (Gray,) or the Algarobia glandulosa. The former is a small tree, from 6 to 12 feet in height; the latter 20 to 30 feet, and described as being abundant on the plains of Western Texas. They both belong to the Acacia family, and are armed with prickles. Dr. Gray gives no hint in reference to their gum-bearing quality, which may be due to the botanical collections being made at a season earlier than that stated by Dr. Shumard, as favorable to the exudation of the gum. (See Plantæ Wrightianæ, No. 1, Smithson. Contrib. 1852.)

At page 268 of Redwood's Grey's Supplement, the following statement occurs, which shows that Dr. Shumard is not the original discoverer of this gum, nor of its use instead of gum arabic.

"Prosopis dulcis (Kunth,). Mexico. Yields a gum, *mezquitina goma mezquitina*, which is used instead of gum arabic."

Now Dr. Grey refers to Prosopis dulcis, in his account of Algarobia glandulosa, and thinks they are not synonymous; yet as some doubts seem to exist, the difference between Kunth's Prosopis and the Algarobia may be due to accidental causes, as it is well known that plants are modified by growth in high land and along water courses. At all events, in the absence of any clue to the name of the plant from Dr. Shumard, we are justified in referring it to Algarobia glandulosa or Prosopis dulcis.

GLEANINGS—PHARMACEUTICAL, CHEMICAL AND MEDICAL.

Carbazotic acid, (*Picric acid.*) Prof. CRACE CALVERT at the late meeting of the British Association at Liverpool, stated that Dr. Bell, of Manchester, had treated cases of intermittent fever most successfully with carbazotic acid, and he believed it to be

a valuable substitute for quinia. It is easily prepared from carbolic acid, (coal tar creasote,) and Mr. R. Warrington observed, that the acid can be made from the Australian product, called "black gum," by acting on it with nitric acid, at the small price of one shilling sterling a pound.—(*Pharm. Jour.*)

This acid is also formed by the action of nitric acid on indigo, salicine, silk, aloes, oil of gaultheria and other substances. The nitric acid should be fuming and the action assisted by heat. The acid should be purified by solution in boiling water, and crystallization by cooling. This acid forms with potash a slightly soluble salt, and is employed as a test for that alkali.

Carbolic acid. Prof. CALVERT on the same occasion stated that carbolic acid was an excellent antiseptic, and that a bird stuffer of his acquaintance, at Manchester, preserved the skins of birds by merely washing the insides with this acid. It was also used for injecting dead bodies for dissection to preserve them from change. For this purpose the acid is mixed with water, and it was found not to materially affect the appearance of the tissues. Dr. Calvert further stated that in Manchester, carbolic acid can be procured at 50 cents per gallon!—(*Pharm. Jour.*)

Preservation of Milk. At the same meeting, the Abbé Moigno described the following method of preserving both milk and cream sweet and sound for six months. The milk is introduced into cylindrical iron bottles fitted with a leaden tube or neck at top, at the boiling temperature, so as to exclude all atmospheric air, and the neck is then pinched a little below the top so as to effectually close it, after which, the part above the contraction is cut off; by this means every particle of air is excluded, and the agent of decomposition not being present, the milk keeps well.—(*Pharm. Jour.*)

Preservation of flesh meat. It is well known that in the region of South America, which affords the largest supply of hides to commerce, an immense quantity of beef is annually left to decay, after the removal of the hides from the slaughtered animals. The idea of bringing this beef into market having been suggested by mercantile gentlemen of Liverpool, George Hamilton, Esq., undertook a series of experiments, with the view of preserving the meat in a fresh state during its transportation to Europe. The plan adopted, as a basis, was to enclose the flesh in a suitable vessel, and displace the atmospheric air completely,

with some other gas having antiseptic qualities. After trying chlorine, ammonia and others, he found that nitric oxide (NO^2) gas was most efficient. Half a pound of fresh meat was suspended in a glass stoppered bottle, on a spit of wood, and the bottle filled with nitric acid. "At the end of 21 days the color was not changed, there was a faint odor of nitrous acid, and the beef was perfectly fresh and good." From his numerous experiments, Mr. Hamilton concludes, "that nitric oxide preserves beef from putrifaction for at least five months. The meat retains its natural color and consistence almost perfectly unchanged. It is necessary that the proportion of gas to beef should not be below a certain relation, else the meat spoils; and on the other hand, if the quantity of gas is too large, the juices of the meat exude in too large a quantity. Meat preserved in this way, when roasted, is apt to have an acid taste, but when boiled in several waters this is removed. The author believes the injurious action of the gas may be modified by the admixture of nitrogen."—(*Pharm. Jour.*)

Black pepper of Western Africa, Cubeba Clusii, (Miguel.) Dr. W. F. Daniell, (in the Pharm. Jour., for Nov. 1854,) gives a detailed account of this plant, accompanied by a figure. This species of pepper appears to have been known in early Portuguese commerce with Africa, and is produced in the mountainous countries of equinoctial Africa. The plant is climbing, and attaches itself to trees in the forest, flowers in October and November, and the fruit is collected in January, while yet immature. The fruit is borne on an irregular raceme. The dried berries are globose, and have the remains of the stalk attached, which has given them the name of *tailed pepper*. Their taste is camphoraceous, peppery and moderately acid in a fresh state, diffusing a rich aromatic odor, and reminding one of cubebs when chewed, but are more allied to black pepper on the whole.

According to Mr. Hanbury, these berries have been imported recently as African Cubebs. Dr. Daniell is not aware that they are used in Africa, for the purposes to which the East Indian drug is applied.

Mercurial Ointment. M. Pomenti, of Bastia, recommends the use of nitrate of potassa to facilitate the extinguishment of mercury, in making this ointment. A drachm and a half of the salt dissolved in a little water, and mixed with eight ounces of

lard, is triturated with 35 ounces of mercury for a few minutes, and the remainder of the lard added. The mercury is reduced to extreme division in a very short time. What effect the nitrate has in modifying the action of the ointment is not explained by the author.—(*Pharm. Jour.*)

Bin oxide of lead. Wohler states, (*Ann. der Chem.*) that bin-oxide of lead can be readily procured by mixing four parts of crystallized acetate of lead, and three parts of crystallized carbonate of soda in water, and passing chlorine into the mixed carbonate of lead and acetate of soda, until both salts are decomposed with the formation of bin oxide of lead and chloride of potassium. These proportions yield two and a half parts of the bin oxide.—(*Pharm. Jour.*)

Anhydrous Persulphate of Iron. Mr. Peter Hart, of Manchester, England, has discovered a crystallized anhydrous tersulphate of sesqui oxide of iron, in the platinum retorts in which oil of vitriol is concentrated. He traces it to the iron rods coated with lead, which support the covers to the preparatory evaporators. These rods occasionally become exposed, and the acid fumes act on them and cause the formation of a salt of iron, which drops into the acid, and is dissolved to separate from it in the last process of concentration ; several careful analyses proved it to be quite pure. This salt has a pinkish white color, and is slowly soluble in water.—(*Annals of Pharmacy.*)

Artificial preparation of Oil of Cinnamon. M. Strecker, some years ago, ascertained that *Styrone*, the oily liquid obtained by distilling purified storax with potash, was the alcohol of cinnamic acid. He has recently proved that, when styrone is treated with platina black, as in making common aldehyde, the product is pure oil of cinnamon, which is the *aldehyd of cinnamic acid.* The following equation represents the reaction : styrone, C_{18} H_{10} O_2, by absorbing O_2 becomes C_{18} H_8 O_2 + 2HO.—(*Comptes Rendus.*)

Henbane Segars. Dr. Seifert, of Vienna, has personally experienced benefit from the use of segars medicated with hyoscyamus leaves, in some affections of the chest. He directs them to be made from tobacco leaves previously deprived of their acrid principle, and in making each segar, from five to eight grains of powdered henbane leaves is introduced. He has prescribed from 4 to 8 such segars daily.—(*Annals of Pharm.*)

Artificial formation of Taurine. The formula of taurine is $C_4\ H_7\ NO_6\ S_2$. M. Strecker after several courses of experiment to form this body artificially, finally succeeded in making it from the isäthionate of ammonia, which salt contains the elements of taurine, plus 2 equiv. of water, thus

$$NH^4O,\ C_4\ H_5\ S_2\ O_7 = C_4\ H_7\ NO_6\ S_2 + 2HO.$$

Isäthionic acid is obtained from olefiant gas and anhydrous sulphuric acid, or from the same acid with alcohol or ether. To isolate it, the mixture is saturated with baryta, and the barytic salt precipitated by alcohol, and this decomposed by carbonate of ammonia. The ammoniacal isäthionate crystallizes in rhombic tables. The author found that taurine could be heated to 464° F. without decomposition. Isäthionate of ammonia fuses at 266° F., and can be heated to 392° without alteration; at 410°, it evolves water; and after being continued at 428° it loses 10 to 12 per cent. and undergoes change, becoming solid and colored. The changed salt dissolves in water readily, and was precipitated from it by alcohol in colorless crystals, possessing completely the crystalline form and characteristics of taurine obtained from bile.—(*Annals of Pharm.*)

How to take Quinine without tasting it. Dr. W. H. Edwards says, that quinine may be taken without tasting its bitterness, by putting the salt in powder in the middle of a tablespoonful of thick mucilage of slippery elm, so as not to touch the spoon, and immediately swallowing it. The mucilage is obtained by macerating several long slips of the bark in a tumbler of water, and after the bark has swollen and become surrounded by mucilage, strip this off into the spoon by drawing the bark between the thumb and forefinger. If the quinine is dextrously enveloped in the mucilage, the patient is unconscious of having taken a bitter dose.—(*Annals.*)

Valerian root adulterated with Scabious root. M. O. Reveil, (Jour. de Chimie Med. Oct. 1854.) states that he has detected the roots of Scabiosa succisa and S. arvensis to the extent of 22 per cent. in the Valerian in the shops of the herborists of Paris. The caudex of the scabious is shorter, truncated at its base; the radicles a little larger and smoother, having but little evidence of longitudinal striæ, are very fragile, fracturing with great facility, presenting a whitish amylaceous surface. These roots are inodorous, but soon acquire the odor of valerian by association.

Strogonoff's tincture for the Cholera. M. O. Reveil, (Jour. de Chimie Med.) has seen prescribed powdered charcoal, a tablespoonful at a time, in the form of injections, in cholera; and at the same time administered the same dose by the stomach.

In the collapsed stage, the same physicians have employed, with success, the tincture of Strogonoff, which has the following composition. Tincture of nux vomica, and tincture of arnica, each *four* parts; ethereal tincture of valerian, and Hoffman's anodyne, each *eight* parts; tincture of aconite, *twelve* parts; tincture of opium, *six* parts; essence of mint, *two* parts; mixed. Of this tincture, 15 to 20 drops in good wine are given in case of coldness and extinction of the pulse.

Opium of Algeria. For about ten years past, the culture of opium in Algeria has been encouraged, in an experimental way, by the French government. Quite recently, the French minister of war, submitted five specimens of Algerine opium to a commission of the Academy, with the following results, as regards the per centage of morphia; viz. No. 1, from the village of Montpensier 9.66 per cent; No. 2, grown at Fouka, 11 per cent; No. 3, from the nursery of the government at Algeria, 11.33 per cent; No. 4, from the central nursery of the government 7 per cent.; No. 5, another specimen from the same, 8.33 per cent.

Iodhydrine. M M. Bertholet and de Luca, (Comptes Rend. Oct. 16, 1854,) have ascertained that glycerin saturated with hydriodic acid gas, and kept for fourteen hours in a close vessel at 212° F., and then treated with potash and ether, yields a peculiar iodized liquid, *Iodhydrine.* It is a syrupy, golden colored liquid, sp. grav. 1.783, insoluble in water, but dissolving a fifth of its bulk of that fluid, soluble in alcohol, has a saccharine taste, is not volatile, but burns without residue, evolving iodine vapor. In its formation, two equivalents of glycerin and one of hydriodic acid, yield one eq. of iodhydrine and 6 of water, thus $2C^6\ H^8\ O^6, + HI = C^{12}\ H^{11}\ C_6 + 6HO.$

The authors think it possible that the iodine contained in cod-liver oil and analogous oils, may exist in the form of iodhydrine, or some similar compound.

ON BENZOIC ACID FROM URINE.

BY THE EDITOR.

Within a few years past, and since the discovery of the ready conversion of hippuric into benzoic acid, there have been occasional importations of benzoic acid from Germany, derived from the urine of horses and cattle, and that which we have seen has been beautifully brilliant in its lustre and whiteness. Hippuric acid appears to be proximately composed of benzoic acid and glycocoll, (or sugar of gelatin), and may be decomposed into these bodies by the action of strong acids. For instance, when hippuric acid is boiled in strong muriatic acid, the acid combines with the glycocoll, and liberates the benzoic acid, which precipitates in crystals by the cooling of the solution. Or the glycocoll may be destroyed by oxydizing agents, and the acid thus set at liberty; or, finally, it may be obtained directly from the urine of the cow or horse by suffering that fluid to putrefy, when the glycocoll base of the hippuric acid is destroyed, and by concentration the benzoic acid crystallizes out. It is probable that the acid made by the latter process is liable to be tainted with an unpleasant urinous odor, (not observable when the urine is evaporated whilst fresh, and precipitated with muriatic acid,) when not carefully purified.

Recently a lot of benzoic acid having this peculiarity arrived at the New York Custom House from a German port, and has been rejected on the ground that it is not derived from gum benzoin, but is made from urine, of which fact its odor would lead to suspicion. Now it is well known that much of this acid has heretofore passed unquestioned, and was in reality purer than much of the commercial benzoic acid from benzoin—the latter having empyreumatic oil adhering, which gives it a strong but rather agreeable odor. It becomes an interesting question whether our examiners are justified in rejecting a chemical substance because it is derived from a different source from that usually indicated in books, or acted on in practice. Undoubtedly, if the benzoic acid in question is condemned on the ground that it has not been properly purified from animal matter which, in the opinion of the examiner, renders it unfit for medical use, he is correct; but if no such cause of unfitness exists, and the acid is pure, we cannot understand on what just grounds it

can be condemned, as it is a distinct chemical substance. The time has gone by for fastidiousness in reference to the source of chemicals; to the chemist all matter is interesting, and where his skill suffices to purify a well characterized substance, it should stand on its own merits, and not be judged by its origin. Had this principle been carried out we might yet have been receiving our muriate of ammonia from the sublimations of camel's dung, or our other ammoniacal salts wholly from the distillation of animal matter, instead of resorting to that interesting source of chemical wealth—the coal tar liquor of the gas works.

In relation to the peculiar odor of benzoic acid sublimed from benzoin—due to an empyreumatic oil—we have no reason to believe it is concerned in the medicinal power of the acid, else the other *legitimate* mode of making it in the *wet way*, by boiling the benzoin with lime on an alkali and precipitation by muriatic acid, would be objectionable. Benzoic acid is used in perfumery, and for such use the sublimed acid no doubt has peculiar advantages, but that is no reason why the physician and pharmaceutist should be deprived of a *purer* article at a cheaper rate.

CHEMICAL HISTORY OF LUPULIN.

By M. J. Personne.

The author, in the October number of the "*Journal de Pharmacie*," commenced his essay by giving the natural history of Lupulin, based on a careful study of its development, with the microscope. Passing this by for the present, we propose to give a notice of his results in the second part of his essay contained in the November number of the same Journal.

The matter contained in the grains of lupulin has a complex composition. The principles are of two kinds, those which are obtained by distillation with water, and those which are not volatile with aqueous vapor.

The distillate consists of an acid distilled water on which floats a volatile oil sometimes of a beautiful green color; and M. Personne found that recent lupulin yielded more oil and less acid than old lupulin.

Volatile acid of Lupulin.—After separating the volatile oil, the distilled water was saturated with carbonate of soda and evaporated to dryness. The dry mass dissolved in a little water was treated with sulphuric acid mixed with an equal weight of water, which formed sulphate of soda, and liberated a brown oily liquid which floated on the saline solution, and which emitted a penetrating odor of butyric and valerianic acid.

Submitted to distillation, this oily liquid commences boiling at 266° F., and the temperature becomes stationary at 347° F. for some time, and finally rises to 356 and 392°. By repeated rectifications the boiling point becomes stationary at 347° and the liquid distills without alteration.

This acid, obtained in a state of purity, is a slightly oleaginous liquid very fluid, colorless, a strong and persistent odor of valerianic acid; its taste acid and pungent; it produces a white spot on the tongue like the strong fatty acids; it is not solidified at 4° F., and burns with a sooty flame. Its density at 59° F. is 0.9403.

Burnt with oxide of copper it gave C 58.64 H 9.91 O 31.45 which is equivalent to the formula C^{10} H^{10} O^4 or C^{10} H^9. O^3 + HO. Both the silver and baryta salts of this acid were analysed and afforded results corresponding to the above. The acid in lupulin is therefore *valerianic* acid, a fact corroborated by the odor of the lupulin.

Volatile oil of Lupulin.—This volatile oil, in its crude state, is an oleaginous liquid, more or less fluid according to the age of the lupulin yielding it, and is lighter than water. It has always an intense yellowish green or fine green color; its odor recalls that of the hop, but does not resemble that of valerianic acid, unless the oil has become oxidized by exposure.

When heated it commences to boil at 282° F., and boils for some time between 300 and 320° F., after which the boiling point rises to 572° F. Heat acts injuriously on the oil, a part being changed in the process of rectification.

That portion of the purified oil obtained between 300 and 320° is a very fluid liquid, having a light amber color, an odor which does not recall that of the hop, and a density of 0.8887. It has no acid reaction, but exposed to the air it becomes acid and resinous: it is but slightly soluble in water, to which it com-

municates its odor, this solution is quickly acidified on exposure to the air. The oil is soluble in alcohol and ether, at 2° F. it thickens but retains its transparence, and its circular polarization is right handed.

Sulphuric acid colors it red and unites with a portion forming a copulated acid whose baryta salt is soluble in water. Nitric acid colors it purple at first, but if heated slightly it reacts quickly with the production of valerianic acid and resin. A concentrated solution of potassa when mixed with the oil and exposed to the air forms valerianate of potassa and a resinous matter. Fused potash transforms it into carbonate and valerianate of potassa with the disengagement of hydrogen and a liquid hydro-carbon. This reaction with potassa is important, because after many unsuccessful attempts and a great number of analyses it is this which has developed the true nature of this essence and placed it beside the oil of *valerian*. By repeated rectification from potassa M. Personne obtained light oil having the formulæ C^{10} H^{8}, which boils at 320° F. and which is isomeric with the *borneën* of oil of valerian. The action of potassa fusa on oil of lupulin (or hops) consists in eliminating the liquid hydro-carbon C^{10} H^{8}, and in retracing an oxygenized body which, like the oil of valerian, it transforms into carbonic and valerianic acids, and which is isomeric with *valerol*.

The crude oil C^{56} H^{46} O^{6} may be considered as a mixture of the body C^{10} H^{8} with a body C^{12} H^{10} O^{2} thus; $3\,(C^{12}\,H^{10}\,O^{2}) + 2\,(C^{10}\,H^{8})$. Whilst the purified oil obtained between the temperatures of 300 and 320° may be viewed as $C^{22}\,H^{18}\,O^{2} = C^{12}\,H^{10}\,O^{2} + C^{10}\,H^{8}$.

When the solid residue of lupulin, left after distilling the oil, is dried and exhausted with alcohol, it affords a resinous substance which is transformed into valerianic acid by the action of potassa. On mixing this solid residue with slacked lime, and distilling at a temperature below that necessary to char it, a brown oily liquid is obtained, having a penetrating odor. This oil, when rectified, furnishes a liquid boiling at 194° F., having a penetrating ethereal odor, scarcely soluble in water, very soluble in alcohol and ether, and without action on litmus. The density of this liquid is 0.8009.

This body absorbs oxygen from the air very readily and ra-

pidly acidifies. Treated by potassa, it becomes brown and resinous; it reduces the nitrate of silver with the greatest facility, and is transformed into valerianic acid, without the production of resin, by chromic acid. All these properties designate this body as an aldehyde, and analysis has proved that it is the aldehyd of valerianic acid, with the formulæ C^{10} H^{10} H^2.

M. Personne found no trace of sulphur in the oil of hops.

Fixed principles of Lupulin.—On examining the residue of the lupulin after distillation the author found but two substances to merit special notice—*a complex resinous substance* and a *bitter* principle.

The resinous matter of Lupulin is difficult to obtain in a pure state. The residue noticed before, is boiled with water in successive quantities, till the bitter principle and as much of the acid as possible is removed; it is then boiled in alcohol until all but the cellulose of the lupulin grains is dissolved. The hot alcoholic solution deposits a species of wax by cooling. The cold alcoholic liquor by evaporation yields the resinous matter. As thus obtained it yet retains a little volatile oil and valerianic acid. It softens by the heat of the hand, has a yellow color varying from a golden yellow to deep orange, according to its age and exposure; after long exposure to the air it obstinately retains the odor of hops. It is slightly soluble in water and communicates to it the property of frothing by agitation. Cold solutions of potassa and ammonia dissolve the larger portion of it and separate a resin insoluble in these alkalies, but soluble in alcohol, and which is dry, friable, and odorless. When the alkaline solution is saturated with sulphuric acid the resin is precipitated free from valerianic acid.

This substance should not be considered a true resin but is a product, intermediate between resin and volatile oil. It composes two thirds of the weight of the lupulin of commerce.

The bitter principle—which the author calls *Lapuline*—exists in the aqueous decoction of lupulin, and appears to belong to the class of alkaloids and contains nitrogen. After many attempts in which means of the most varied character were employed he was unsuccessful in isolating this principle in a state of purity, yet he has approached sufficiently near to form an opinion of its nature. It is readily precipitated by tannic acid,

but when an attempt is made to separate it from the tannic precipitate by oxide of lead, nothing was obtained but a resinoid body. The tannic precipitate, as well as the solution of the bitter principle, was treated with potassa in the idea of obtaining a volatile alkali, but the only product was ammonia. To prove whether this ammonia was derived from the decomposition of the bitter principle or from an ammoniacal salt coexisting, he added an alcoholic solution of tartaric acid to an alcoholic tincture of lupulin (1 to 4) and obtained a precipitate of bitartrate of ammonia. The liquid was separated, and by careful evaporation it yielded resinous matter and a bitter acid liquid. This liquid was digested with hydrated carbonate of lead and evaporated at a low temperature, and treated with alcohol which dissolved the bitter principle and left the tartrate and resinate of lead.

The aqueous solution of this body is precipitated by tannin, ioduretted iodide of potassium chloride of gold and chloride of platina, which affords a double salt soluble in alcohol. This, submitted to heat evolves ammoniacal vapors and an odor of burnt horn. Heated with potassa it gives ammonia and a resinous body. When an attempt is made to evaporate the aqueous solution, the residue consists of acetate of ammonia and resinous matter, without bitterness. Being unable to isolate it, or to get a regular combination with this body for analysis, the author has been unable to demonstrate its true nature, yet he feels justified in believing that this extremely unstable bitter principle belongs to the class of the organic alkalies.

After demonstrating the presence of free phosphoric acid in the decoction of lupulin (which he believes is derived from phosphate of lime by the reaction of valerianic acid), the author concludes his second essay by stating that the cavity of the grains of lupulin contains an abundant resinous matter; an essential oil formed of a hydro carbon with the formula C^{10} H^{8}; and an oxygenous body analogous to *valerol* C^{12} H^{10} O^{2}; valerianic acid; a nitrogenous very unstable bitter substance (*lupuline*) possessing some of the properties of the organic alkalies; an ammoniacal salt; and phosphate of lime.

ON A NEW METHOD OF ALKALIMETRY.

By Astley Paston Price, Ph.D., F.C.S.
Chemical Assistant in the Laboratory of the Government School of Mines.

Having had occasion, some time since, to test the comparative value of the ordinary alkalimetrical processes, I was somewhat surprised at the discrepancies in the results I obtained, and also at the somewhat difficult and tedious manipulation necessary when comparatively accurate determinations were required. The most serious impediment in carrying out the usual alkalimetrical processes, arises, as is well known, from the liberation of carbonic acid, the presence of which, even in exceedingly small quantity, being sufficient to mask the point of saturation, and to prevent the indication of the presence of either an excess of acid or of alkali.

After having experienced the difficulties attendant on its presence, and the almost impossibility of rapidly and entirely expelling the liberated carbonic acid from solution, it appeared to me most desirable to seek an alkalimetrical process, in which the carbonic acid should be expelled previous to determining the saturating power of the alkali under examination. It further appeared to me, that in the alkalimetrical processes now in use, there existed another very serious inconvenience, in that the per centage of alkali was determined directly, and not indirectly; that is, that the alkali was estimated, and not the impurities which might be therein contained. This may perhaps be better understood by an example. Pure carbonate of soda contains about 58·5 per cent. of alkali, but commercial carbonate contains only about 50 per cent. Now in the several alkalimetrical processes employed in the arts, the 50 per cent. of alkali is estimated, and not the 8·5 per cent. of impurities, constituting, as these impurities invariably do, by far the smaller proportion of the commercial alkalies or alkaline carbonates.

In practice, it will, I believe, be found advantageous to employ a method which, by indicating the amount of impurities present, will give the available proportion of alkali.

As I have previously remarked, the primary difficulty to be overcome is the entire expulsion of carbonic acid, the presence of but a small quantity of which entirely prevents accurate determination, not only owing to the change of tint produced

by its presence on a solution of litmus, but owing to the diminished sensibility of litmus thus tinted.

In the hope of avoiding those sources of error to which I have alluded, and of facilitating the determination of the per centage of alkali, I adopted a method of alkalimetry which in substance is the following:—To the alkali under examination is added a known excess of a normal solution of oxalic acid; and after the expulsion of carbonic acid from the solution by boiling, the excess of oxalic acid remaining is determined by means of a standard solution of ammonia.

Some objection might be made to the employment of a solution of ammonia; but it will be found that a dilute solution of ammonia; if kept in properly constructed apparatus, will remain more constant than might be expected. The standard solutions of ammonia and of oxalic acid are most easily prepared by means of a standard solution of sulphuric acid, care being taken that perfectly pure acid be employed, and that the amount of real acid be carefully determined.

Having prepared the standard solutions of a desired strength, the determination of an alkali or of an alkaline carbonate may be thus effected:—10 grs. of an alkaline carbonate, carbonate of soda for example, after having been placed in a flask, a solution of oxalic acid corresponding to 10 grs. of pure carbonate of soda is added; the solution is then boiled until the expulsion of carbonic acid be effected, when the solution is diluted with distilled water; and after the addition of a few drops of a solution of litmus, the excess of oxalic acid is determined by a standard solution of ammonia. The excess of oxalic acid remaining will of course indicate the impurities present, or the absence of alkali, which, by deduction from the quantity originally taken, will give the amount of available alkali.

Care must be taken that the solution be only tinted with litmus, and not too deeply colored, as the more feeble the coloration within certain limits, the more easily detected is the change of tint produced by an excess of alkali or acid.

I have found it necessary to employ distilled water, failing, as I have done, to obtain accurate results with other water, owing to the presence of carbonic acid. The preparation of standard solutions is so well understood, that it is unnecessary to enter into further details.

The apparatus I have found most convenient for containing and preserving standard solutions, and more particularly solutions of ammonia, consists of a vessel similar to a wash-bottle, to which is attached an India rubber bulb; so that when it is desired to fill the burette, it is only necessary to compress the bulb. This arrangement affords great facility for replenishing the burette; and by placing a piece of India rubber tubing, closed at one end, on the jet, an air-tight reservoir for the solution is obtained.—*Chem. Gaz. from Proc. Brit. Associa.*, 1854.

ON THE PHYSIOLOGICAL PROPERTIES OF SOME OF THE COMPOUNDS OF THE ORGANIC RADICALS, METHYLE, ETHYLE, AND AMYLE. By JAMES TURNBULL, Esq., Physician to the Liverpool Royal Infirmary.

He had examined two compounds of methyle—the acetate of the oxide of methyle, and the iodide of methyle; four of ethyle—the acetate of the oxide of ethyle, the iodide of ethyle, the bromide of ethyle, and the cyanide of ethyle; two of amyle—the acetate of the oxide of amyle, and the iodide of amyle. The acetate of the oxide of methyle acted as a diffusible stimulant, and checked expectoration—a property common to most of the methyle, ethyle, and amyle compounds. The iodide of methyle produced all the physiological effects of iodine, and might be detected in the saliva and urine in half an hour after it had been swallowed. He had used it as an external remedy in scrofulous ulcers with advantage, and he had used it for inhalation in pulmonary diseases, to promote the healing of ulcers of the lungs; but for the latter purpose he had found another preparation, the iodide of ethyle, more serviceable. The iodide of ethyle he had found a warm stimulating remedy, which produced the physiological effects of iodine, too, but was less stimulating. It acted as a powerful anæsthetic when inhaled, and he had ascertained that the injurious effects which Mr. Nunnely had observed from it had arisen from his having used an impure compound contaminated with phosphorus. He had used it internally in scrofulous diseases with advantage, and as its odor was perceived in the breath there seemed to be a special tendency to the elimination of this and other ethyle compounds through the lungs. As

an external application he had found it more suited for painful and irritable ulcers than the iodide of methyle, which answered best for those of indolent character. He had used it for inhalation in many cases of pulmonary disease, and believed it would prove more valuable for this purpose than any remedy yet introduced. Medical men had hitherto been disappointed in almost all the means tried for the treatment of pulmonary disease by inhalation. This proved that it was either an improper mode of treatment, or that they had not yet met with the right kind of remedies. He believed the latter to be the true cause of past disappointment. Iodine had been much tried, but laid aside on account of its irritating effects; and it had not occurred to any one that, in order to give it for inhalation, it would first be necessary to find a compound possessing the requisite degree of volatility and absence of irritative properties. Iodide of ethyle was in his opinion such a compound, and had much resemblance to chloroform. He believed that it would be found applicable for treatment in the way of inhalation of other diseases, besides those of the lungs, and he mentioned one of dropsy from disease of the heart, treated under his care in the infirmary, where it produced a most beneficial effect. The bromide of ethyle he had found similar in its effects to the iodide of ethyle, more pleasant to the taste and for inhalation, but a very expensive medicine, from the difficulty of preparing it. The cyanide of ethyle he had found possessed the poisonous properties of cyanogen, and he had not therefore used it as a medicine. The acetateof the oxide of amyle and the iodide of amyle had also irritating properties, which rendered them unfit for use as remedies. His researches tended to show that organic radicals might be made to take the place of some of the inorganic radicals, such as sodium or potassium; that iodine, and probably other medicinal agents, were equally capable of producing in such combinations their external beneficial effects, and that, so combined, their volatile properties enabled them to be introduced into the system through a new channel hitherto but little used for such a purpose—viz., the lungs, upon which internal organs their local action might also be obtained in a more advantageous manner.—*London Pharm. Jour. from the Proceedings of the Brit. Assoc.*

ON THE LEAVES OF THE COCA OF PERU (ERYTHROXYLON COCA, LAMARCK.

By Dr. H. A. Weddell.*

Among the numerous vegetable riches of Yungas,† there was none which interested me more than the *Coca*, in consequence of the various and sometimes contradictory opinions put forth regarding it. I trust that a *résumé* of my studies on this remarkable plant will be perused with interest.

My readers are aware that *Coca* is the dried leaf of a shrub to which botanists have given the name *Erythroxylon Coca*;‡ it

* Extracted from Dr. Weddell's *Voyage dans le nord de la Bolivie.* Paris, 1853, 8vo, ch. xxix.

† A province in the north-east of Bolivia.—Ed. Ph. J.

‡ Clusius (1605) appears to be, after Monardes (1569), the first botanist who has treated on *Coca*, which was, however, known in Europe at an earlier period through the accounts given by the historians of the conquest of Peru, but the first who received in Europe authentic specimens of the plant, was Joseph de Jussieu, one of the travelling companions of La Condamine. The life of the adventurous botanist was, however, nearly sacrificed while crossing the Cordillera of Coroico in 1749, in order to study this famous plant. "Il me fallut," he says, "passer la montagne neigée et marcher plus de 4 à 5 lieues dans la neige, la descendre par des chemins taillés en forme d'escalier, au bord de précipices affreux, et avoir à chaque instant, et pendant 7 à 8 lieues, la mort devant les yeux. Ma mule s'abattit deux ou trois fois sous moi; je fus obligé de la laisser estropiée et hors d état de me pouvoir servir davantage. La violence des rayons du soleil réfléchis par la niege me causa une des plus douloureuses ophthalmies que j'aie éprouvées de ma vie et ce qui me chagrinait le plus était la crainte de devenir aveugle, car je ne voyais rien. Mais une abondante fluxion de larmes, causée par la même irritation, au bout de vingt-quatre heures d'un tourment continuel, me rendit la vue et la sérénité, et fut ma guérison. La beauté et l'abondance des différentes plantes que produit cette région me consolèrent et me dédommagérent des travaux passés." . . .

The specimens sent by Joseph de Jussieu to his brother, in 1750, were subsequently examined by Antoine-Laurent de Jussieu, who referred the plant to the genus *Erythroxylon*, and finally served as types for the description which Lamarck gave of it under the name *Erythroxylon Coca* in his *Encyclopédie.*

The generic name refers to the color of the wood of several of the plants composing the group; as to the word *Coca*, of which, so far as I know, no one has sought to give the etymology, it probably comes from the Aymara

occurs wild, I am told, in several parts of Bolivia; but I have myself studied it only in the cultivated state, and it is this cultivated plant alone that will be here in question.

The employment of *Coca* as a masticatory* goes back to the time of the first Incas, a period when it was reserved essentially for the solemnities of religion† and for the use of the monarch; none other might raise it to his mouth, unless he had rendered himself worthy by his services, of partaking this honor with his sovereign.

The localities in the Peruvian empire where the plant could be cultivated, were then few in number; but in proportion as its territories became extended by new conquests, plantations were multiplied, and the use of *Coca*, spreading more and more, became at last general; so that at the period of the Spanish invasion, the Peruvians were accustomed to use the article as a medium of exchange; and when money of gold and silver entered into circulation, *Coca* was the principal object of commerce in the country.

The Spanish speculators appreciating the advantages they might derive from the culture of the plant, were not slow in appropriating it to themselves as a monopoly; and so great were the profits they obtained, that, the number of plantations having increased beyond measure, there were soon not hands enough in the valleys to give them the requisite care. They then employed the Indians of the Cordillera, enrolling them by force as for the labor of the mines. But the transition from a cold and dry climate to one both warm and moist, reacted so fatally on the health of the new workmen that the central government, roused by the numerous complaints addressed to them on the subject,

Khoka, signifying *tree* or *plant*. The shrub producing the Paraguay Tea (*Ilex Paraguariensis*) is called *la Yerba*, i. e. *the plant;* and the same may be the case with the Peruvian *Coca*.

* In accordance with usage, I designate *Coca* a *masticatory*. In its use, it is however distinguished from ordinary masticatories, and especially from tobacco, by one peculiarity, which is, that the saliva, the secretion of which it excites, is never rejected.

† The sacrificing priests never consulted the oracles without holding some *Coca* leaves in the mouth, and throwing some into the fire which consumed the victims.

was on the point of ordering the destruction *en masse* of all the plantations of the country. The representations of the parties interested in the question, supported by the arguments of several celebrated legal authorities, diverted this threatening resolution, and the cultivation of the *Coca* remained authorized, on the condition of only voluntary and well-paid laborers being employed upon it.

One may form some idea of the warmth with which the government espoused the cause of the Indians in this affair, from the fact of the viceroy of Peru, Don Francisco de Toledo, having promulgated no fewer than seventy-one decrees in their favor.

This occurred in the latter half of the sixteenth century. In the following century the cultivation of *Coca* took a retrograde step, in consequence of the diminution of the Indians, who were its chief consumers; but by little and little the trade afresh increased, so much so indeed that at the present day it appears to be about equal in importance to what it was at the period of its greatest prosperity, when in the mines of Cerro de Potosi alone it was consumed to the extent of a million *kilogrammes* [2,204,-860 pounds (Avoird.)] annually.

The cultivation of *Erythroxylon Coca*, as carried on in Bolivia in the present day, does not appear to differ from that which prevailed previous to the conquest; and the province of Yungas de la Paz* is that which, since the Spanish occupation, seems to have supported the most considerable plantations. All the slopes of the mountains, below an elevation of 2200 *mètres* [7217 feet,] are literally covered with them, and the traveller has continually in view the factories or *haciendas* where the leaf is prepared for the purposes of trade.

The *Coca* shrub is propagated from seed. For this purpose the seeds, immediately after gathering, are scattered on the surface of the light and frequently watered soil of a little nursery (*almaciga*) where they come up generally at the end of ten or fifteen days. The waterings are continued, and should the sun strike the young plants too violently, they are sheltered with mats.

* The word *yungas* signifies in the Aymara language, *warm valleys*. The medium temperature is from 18° to 20° [64° to 68° Fahr.]

The following year the shrubs, whose height is already from 40 to 50 *centimètres* [16 to 20 inches] are transplanted into a plot of ground specially prepared for them and called a *cocal.* The arrangement of these plantations is much more complicated than that of an ordinary plantation, and varies according to the inclination of the surface. When the *cocal* occupies the slope of a mountain, which is the usual case, the cultivator forms a series of narrow steps, each intended for a single row of shrubs, and the more elevated (consequently the less numerous) as the surface is more steep.* They are generally supported by little stone walls, which serve not merely to contain the earth and prevent its drying, but also to protect the stem and roots of the young shrubs from the too direct influence of the solar rays, by means of the projection which they form above the level of the soil.

Where the ground is level they make, instead of steps or terraces, simple furrows (*uachos*) in a straight line and separated from one another by little walls of well-moulded earth, called *umachas,* at the foot of each of which is planted a row of the shrubs more or less apart from each other.

At the end of a year and a half the plant affords its first crop, and from this period to the age of forty years or more it continues to yield a supply. Instances are cited of *Coca* plantations which have existed for nearly a century, and which still produce. Nevertheless, the greatest abundance of leaves is obtained from plants of from three to six years of age. When the trees run up too much, the produce is less than when they spread; they are therefore pruned in some cases to favor an increase in breadth which, however, is never considerable as the form of the shrub is irregular. The average height of the wild plant appears to be about two *mètres;* but in cultivation it is generally allowed to attain but one *mètre* [39 inches.]

The first gathering which takes place in a Coca plantation is at the expense of only the lower leaves of the shrubs; and it is therefore called *quita calzon.*† The leaves of which this gathering consists are larger and more coriaceous than those of subse-

* On some of the slopes the inclination exceeds 45°.

† From *quitar,* to take away, and *calzon,* pantaloon.

quent collections, and also have less flavor. They are mostly consumed on the spot. All the other gatherings go by the name of *mitas*, and take place three times, or exceptionally four times, per annum. The most abundant harvest is that occurring in March, that is, immediately after the rains; this is the *mita de marzo*. The most scanty is that which takes place at the end of June, or beginning of July, and which is called *mita de San Juan*. The third, named *mita de Santos*, is made in October or November.

The watering of the Coca plantations greatly increases their productiveness. Forty days are then sufficient, I have been told, for naked shrubs to become covered with new leaves; but these leaves are not equal in their properties to those produced without irrigation; their color also is less deep, and they frequently blacken in drying. Artificial watering is needful, moreover, only during the dry season, and the cultivators who have the means of employing it, realize nearly always four, and sometimes even five, crops in the year. This is particularly the case in the districts of Irupana, where there are facilities for obtaining water that do not exist elsewhere.

I have examined the soil in which *Coca* is cultivated, and almost everywhere have found it composed of sandy, argillaceous earth, softish to the touch; it originates in the decay of the schists, which form the chief geological feature of these mountains. The soil of the coca plantation is, in one word, formed of what we call primitive or normal earth [*terre franche ou normale*;]* but it is naturally mixed with an abundance of angular fragments of unaltered schist, which, if not removed, would interfere with the growth of the roots. This is therefore done by the cultivator while preparing the furrows for the reception of the shrubs, the stones being employed for the little walls before spoken of; indeed these little walls or *umachas* are often formed entirely of the stones thus met with. I need hardly say that it is to the greater or less perfection to which this preliminary operation is carried, and to the labors incurred subsequently in stirring up the soil from time to time, and in keeping it free from weeds, that the *haciendero* owes the abundance of his crops. The

* This is also the soil of almost all the virgin forests of the Andes.

last operation I have mentioned, is especially needful while the shrubs are young. The weeding, which is regularly performed after each crop has been collected, is called *mazi.*

The collection of the leaves of the *Erythroxylon* is performed much in the same way as that of tea. It is, in general, women and children that are employed upon this operation, which is all the easier from the presence of the little walls separating the furrows of the plantation. The gatherer squats down, and holding with one hand the branch she wishes to pluck, removes with the other all the leaves, often one by one. The leaves are deposited in a cloth which each Indian carries with her, and afterwards collected in sacks or some other recipients to be carried from the plantation.

Nothing is now easier than the preparation of the *Coca.* The leaves are carried from the plantation to the house, or *casa de hacienda,* where they are spread out in the sun, in little courts constructed especially for the purpose, and the floors of which are formed of slabs of black schist (*pizura;*) if the weather is fine they are left there until completely dry, which takes place without their shape becoming altered. They are then packed with strong pressure into bags made of the sheath of the banana leaf, strengthened with an outer covering of coarse woollen canvas. The bales thus formed contain, on an average, twenty-four pounds of leaves, and go by the name of *cestos.* The *tambor* is a bale of double the size of the *cesto,* whose price at La Paz varies from 4½ to 6 piastres (22 fr. 50 c. to 30 fr.)

I have endeavored to collect some data as to the average production of the plantations of coca in the province of Yungas, but the information given me on this subject is but vague. The surface under cultivation is estimated by the *cato,* a superficial measure varying according to the district, but which appears, on an average, to equal about 900 square *mètres* (9 *ares.*) The produce of the most flourishing coca grounds of Yungas appears to be in the proportion of from eleven to twelve *cestos, i. e.* 264 to 288 pounds, of dried leaves per *cato,* whilst the poorest plantations afford but from one to two *cestos* at each gathering. The medium production would be from seven to eight *cestos* per *cato.* The annual produce of the whole province is estimated at more than 400,000 *cestos,* or 9,600,000 Spanish pounds.

(To be continued.)

MATERIALS FOR PAPER-MAKING PROCURABLE FROM INDIA.

By J. Forbes Royle, M. D. F.R.S.

Paper; it is well known, is in Europe made chiefly from linen or cotton rags, but also from the refuge and sweepings of cotton and flax mills, as also of the coverings of our cotton bales and of worn-out ropes. But paper is also made from the stems and leaves of many grasses, as from rice-straw, and from the bamboo by the Chinese, and of late from common straw in this country, and even from wood shavings. The fibrous part of many lily and aloe-leaved plants have been converted into excellent paper in India, where the fibres of tiliaceous, malvaceous, and leguminous plants are employed for the same purpose. As in the Himalayas one of the lace-bark tribe is similarly employed, and in China one of the mulberry tribe, and the nettle in Holland. I mention these various sources, because plants belonging to the same families as the above abound in India and other warm countries, and are capable of yielding a very abundant and never-failing supply of sufficiently cheap and very excellent materials for paper-making of all kinds. Some may be used without any further process of bleaching, but all are capable of having any color they may possess destroyed by chemical means, as I would not even except the jute canvas or gunny bagging, because I have seen specimens of jute of a beautiful silky white, both plain and manufactured into fabrics for furniture, &c., as shown by the late Colonel Calvert at the East-India House. As the Chinese make paper of rice-straw, and of the young shoots of the bamboo, while the Hindoos make ropes of different grasses (such as Saccharum munja, and Saccharum sara), strong enough for their Persian wheels as well as for towing lines, it is evident that these, and probably many others, contain a sufficiency of fibrous material for paper-making. The cultivated cereals cannot well be turned to much account, for their straw forms the chief food for cattle; but as the country abounds with grass jungles, which are in the autumn of every year burnt down in order that the young blades may spring up and afford pasturage for cattle, it is evident that there are many situations where a sufficiency might be cut down before it has become per-

fectly dried up, and converted into *half-stuff* for paper-makers. Of the sedges also some are employed in India for making ropes, as the Bhabhur or *Eriophorum cannabinum*, for making rope bridges for crossing some of the hill torrents. The papyrus, we know, was used by the Egyptians for making their paper, but this was by cutting the material into thin slices and making them adhere together under pressure. But others of the genus, as the Cyperus tegetum, is used in India for mat-making. As these plants, as well as rushes, grow together in large quantities, it would be quite possible in many places to turn them to profitable account.

Many parts of the world abound in the lily and aloe-leaved plants which have been alluded to above, and of which the leaves contain much easily separable fibrous materials. These belong to the genera Agave, Aloe, Yucca, Sauseviera, Bromelia, and others, all of which abound in white-colored fibres, applicable to various useful purposes, and of which the tow might be used for paper-making, and considerable supplies obtained. Paper used to be made from the Sauseviera in Trichinopoly, and some made of the unbleached Agave alone, and also mixed with old gunny bags.

Among cultivated plants there is probably nothing so well calculated to yield a large supply of material fit for making paper of almost every quality, as the plantain (*Musa paradisiaca*), so extensively cultivated in all tropical countries on account of its fruit, of which the fibre-yielding stems are applied to no useful purpose. The plant, as every one acquainted with tropical countries knows, is common near the poorest huts and in the largest gardens, and is considered to yield by far the largest quantity of nutritious matter. Its fruit, in many places supplying the place of bread, and in composition and nutritious value approaching most nearly to the potato, may, if produced in too large a quantity, be preserved in the same way as figs, or the meal may be separated, as it resembles rice most nearly in composition. Each root-stock throws up from six to eight or ten stems, each of which must be yearly cut down, and will yield from three to four pounds of the fibre fit for textile fabrics, for rope-making, or for the manufacture of paper. As the fruit already pays the expenses of the culture, this fibre could be af-

forded at a cheap rate, as from the nature of the plant, consisting almost only of water and fibre, the latter might be easily separated. One planter calculates that it could be afforded for £9 13*s.* 4*d.* per ton. Some very useful and tough kinds of paper have beén made from the plantain, and some of finer quality from the same material in France.

All the plants which have been already mentioned are devoid of true bark, and are called endogenous in structure. Simple pressure between rollers, and washing, would appear to be sufficient for the separation of the fibres of most of them. But the following families of plants are all possessed of true bark, which requires to be stripped off, usually after the stems have been steeped in water, before their respective fibres can be separated from the rest of the vegetable matter.

The flax plant abounds in fibre, but this is too valuable to be converted into paper. India, however, grows immense quantities of the plant on account of its seed (linseed), which is both consumed in the country and exported in enormous quantities, but nowhere is the fibre turned to any account. This is no doubt owing to the climate not favoring the formation of soft and flexible fibre; but the short fibre which is formed and might be easily separated, would be valuable for paper-making, and might add to the agriculturist's profits without much additional outlay.

Some valvaceous plants are cultivated on account of their fruits, being used as articles of diet, as the Okhro (*Hibiscus esculentus*) of the West Indies and of the United States. The *Ramturai* of India is closely allied to it, and is cultivated for the same purposes. Both plants abound in fine flexible fibre, which is not, but might be easily, separated, and afford a considerable supply, especially if the cultivation was extended in the neighborhood of towns. Paper is made from a species of *Hibiscus* in Japan, and *Hibiscus Sabdariffa* is cultivated in India on account of its jelly-yielding calyxes. Numerous other species of Hibiscus, of Sida, and of other genera of this family abound in warm climates; several are cultivated in different countries, as *Hibiscus Canabinus* and *Sida Tiliæfolia* in China; more might be so. They grow quickly and to a large size, and abound in fibrous material of a fine, soft, flexible quality, on which account

they might be cultivated with profit, and the tow be useful to the paper-maker.

The *Tiliaceæ* are likewise remarkable for the abundance and fine quality of fibre which many of them contain. *Tilia Europea* produces the enormous quantities of bast exported from Russia. *Corchorus olithorius* and *Corchorus capsularis*, the leaves of both of which are used as a vegetable, yield the large supply of jute imported into this country, as well as the gunny cloth and bags exported even to America. Several species of *Grewia* yield fruit, on which account they are cultivated. Others abound in the jungles, and most would yield a valuable fibre, as some of them already do, for commercial purposes. Some paper is made from gunny bags. Some of the Leguminosæ also abound in valuable fibre. *Crotalaria juncea* yields the common *sunn* of India. *Sesbania Cannabina* yields the *dhanchi* of Bengal; while *Bauhinea racemosa* is used in making the rope bridges in the Himalayas. The fibre of *Parkinsonia aculeata* was sent to the exhibition in 1851, expressly as being fitted for paper-making; though colorless it wants strength.

Several plants produce large quantities of a silky, cotton-like substance, not applied to any use, such as the silk-cotton tree, the mudar of India, and several species of Saccharum, which might be collected where labor is cheap, and would no doubt be well fitted for conversion into pulp for paper.

Among the nettle, the mulberry, and bread-fruit tribes of plants, there are many which seem well calculated to yield material for paper-making. The Chinese, we know, employ the inner bark of morus, now *Broussonetia papyrifera*. This, no doubt, produces some of the Chinese paper, which is remarkable for toughness. I believe that the refuse cuttings of the bush cultivation of the mulberry in Bengal might be turned to profitable account. The barks of many stinging (*Urtica*) and of stingless (*Bohemeria*) nettles abound in fibres remarkable for strength; the tow of these might be converted into paper-stuff if not required for mixing with wool.

The weeds of tropical countries, which grow in such luxuriance, and among which are species of sida, of grewia, of corchorus, of triumfetta, and of many other genera, might all yield an abundance of fibrous material if the refuse of the above cultivated plants was found not to be sufficient. Some simple

machinery for separating the fibre would greatly facilitate operations, while the expenses of freight might be diminished by compression, or, as suggested, by packing the material as dunnage, and the cheapness of labor, as of everything else in many of these countries, would enable material for paper-making to be brought here in great abundance, and at a sufficiently cheap rate, if ordinary pains were taken by the consumers in Europe to encourage the planter or colonist of a distant region.—*London Pharm. Journ., from Journal of the Society of Arts.*

East India House, May 3d, 1824.

ON SAPONINE AND SENEGINE.

By P. A. Bolley.

Bley and Bussey have found in the root of *Gypsophylla strathium* the so-called Levantine soap-root, a peculiar vegetable principle, which the former termed struthiin, and the latter saponine. In so far as an assumption may be hazarded, it is the same substance which has been previously found in *Saponaria officinalis.* Bussey has ascertained the composition of this substance. The senegine discovered by Gehlen, a bitter substance obtained from the root of *Polygala senega,* has been closely examined by Quevenne, and the elementary analysis known was performed by this chemist.

The physical and chemical properties of both substances are so analogous that the subject excited Quevenne's attention, but a comparison of some reactions which he undertook led him to the conclusion that it was quite a different body. At the most, his conclusion was supported by the elementary analysis of saponine made by Bussey, and by that made by himself of senegine. The principal difference should be found in an important distinction in their behaviour towards concentrated muriatic acid.

According to Bussey, saponine contains 51 per cent. of carbon, 7.4 per cent. of hydrogen; and senegine, according to Quevenne, 55.704 per cent. of carbon, and 7.529 per cent. of hydrogen.

I have prepared Senegine according to Quevenne's process

from the officinal extract, by precipitating with sugar of lead, filtering, washing, and decomposing the precipitate with sulphuretted hydrogen, filtering, evaporating, taking up in hot alcohol, evaporating, agitating with ether, dissolving the portion not taken up by ether in water, precipitating with diacetate of lead, filtering, washing, diffusing the precipitate in water, decomposing by sulphuretted hydrogen, filtering, evaporating, taking up in boiling alcohol, and allowing to cool.

That which I obtained agreed considerably in its chemical behaviour and external properties with Quevenne's senegine, but I have not succeeded in obtaining this body perfectly white; the powder had always a grey, yellowish shade, resembling quertannic acid, and was never obtained quite free of inorganic constituents. Only by repeated solution in strong hot alcohol, and cooling, by which the chief part of these bodies separates, I reduced them to 1 per cent.

Bussey's saponine is prepared in a very simple way, by boiling the incised root with alcohol of 85 per cent., and hot filtration and cooling, whereby the saponine separates. The substance obtained was quite white, but likewise not completely free from ash, but still the incombustible portion was less than in the mass obtained from the extract of senega.

Both substances possessed all the properties everywhere ascribed to them—slight solubility in cold, and greater in hot water; frothing of their solutions; solubility in alcohol, which is greater in diluted than in anhydrous alcohol, and greater in hot than in cold alcohol; insolubility in ether, and absence of definite form. Taste at the commencement somewhat sweet, but afterwards slightly pungent and bitterish.

By the combustion of these bodies I obtained results from which I calculate the formulæ for senegine, $C_{36}\ H_{24}\ O_{30}$, and for saponine $C_{36}\ H_{28}\ O_{24}$. It will be seen that there is a considerable difference in the quantity of water contained in them.

I believe that I shall succeed in showing that the bitter principles of these roots are one and the same, or, at least, exhibited no greater difference than is expressed by the above analyses.

Fremy produced by the action of alkalies or diluted acids on Bussey's saponine, a new acid, which he termed æsculinic acid, because it could be prepared from a bitter substance existing in horse chestnuts.

This acid is a white uncrystalline substance, almost insoluble in cold water and ether, but soluble in hot water and alcohol, and occasions strong frothing. Fleury found its composition to be C 57.260, H 8.352, O 34.388.

I treated a clear aqueous solution of the bitter matter of senega with diluted sulphuric acid; after some time it became turbid from the separation of white flocks. By filtration and washing, which is very troublesome, on account of the gelatinous nature of the solid substance, a powder was obtained, which after drying exhibited all the properties of æsculinic acid. I also prepared the same substance from a decoction of senega, without previously separating the senegine, and prepared this substance from the saponine, which was made according to Bussey's directions.

The analyses of these substances afforded the same formulæ for their composition, namely, $C_{24} H_{18} O_{10}$.

Supported by these analyses, it may be with certainty assumed, that the peculiar principles of senega and soap root are one and the same body, and in spite of the difference which these analyses and that of Fleury shows, it is in the highest degree probable that this æsculinic acid is nothing else than the product of decomposition, which is afforded by the action of dilute acids on saponine as well as on senegine, and also that Quevenne's *acide polygalique modifié*, obtained by the action of muriatic acid on his senegine, is the same body.

As was to be expected, a hydrate of carbon was obtained, and at the same time sugar, or a sweet body possessing the known reaction on an alkaline solution of copper.

According to the analogy of salegenine, this product of the decomposition of senegine may be termed sapogenine.

It is very probable that water is taken up by saponine when it is broken up into sapogenine and sugar, as shown by the following equation:—

4 equivalents of sugar $C_{48} H_{40} O_{40}$
1 " sapogenine $C_{24} H_{18} O_{10}$

$C_{72} H_{58} O_{50} = 2 (C_{36} H_{24} O_{20}) + 10 HO.$

Annals of Pharmacy, from Annalen der Chemie.

ON PYROGUAIACINE.

By E. Ebermayer.

The author has obtained a crystallized product by the dry distillation of guaiacum resin. A similar substance has also been described by Deville and Pelletier, from whose analysis the composition of this substance appears to be 76·93 carbon, 7·46 hydrogen, and 15·59 oxygen. It is probably the same substance obtained by Ebermayer, and called by him pyroguaiacine. All specimens of this resin may not produce this body, as Völckel, who has also investigated the products of the distillation of the resin, does not mention it at all, and the author has obtained very different quantities from different resins. In favorable cases he obtained 6 grms. of the pure substance from 6 lbs. of the resin; it was purified by filtration from the oily products, and then by crystallization from alcohol.

Pyroguaiacine has the constitution $C^{14} H^{7} O^{2}$. It is a neutral body, which may be sublimed without change; it is colorless, but when crystallized from alcohol is of a rose or yellowish color; it crystallizes in small laminæ or in long needles, swells up in potash, and is extracted again unchanged by alcohol from the air-dried potash compound, after the potash has been saturated with carbonic acid.

When heated for a long time with caustic ammonia, pyroguaiacine acquires a yellow color; its alcoholic solution, saturated with ammonia, leaves a yellow mass of nearly unchanged pyroguaiacine. When alcoholic solutions of oxide of silver and pyroguaiacine are mixed, silver is reduced.

Dilute sulphuric acid does not act upon pyroguaiacine; but if the latter substance be suspended in water, and concentrated sulphuric acid be dropped into it, and the whole heated, it first of all becomes yellow, then dissolves with a rose-color, and lastly a blue-black substance separates. Concentrated sulphuric acid becomes very strongly heated in contact with pyroguaiacine; the acid first becomes brown, then dingy green, and lastly deep blue, from the separation of a blue-black body containing sulphur.

Chlorine gas, when passed through water in which pyroguaiacine is suspended, colors this first yellow, and lastly brown. The final product is a brittle readily-pulverizable mass, which, like

the wash-water, has a strong musky odor. The analysis I. is of pyroguaiacine crystallized from alcohol; II. is sublimed:—

	I.	II.		
Carbon . .	78·462	78·471	14	78·504
Hydrogen .	6·901	7·042	7	6·542
Oxygen . .	14·637	14·487	2	14·953

—*Chem. Gaz. Oct.* 16, *from Journ. für Prakt. Chem.*, lxii. p. 291.

ON A METHOD OF ANALYSIS APPLICABLE TO THE QUANTITATIVE ESTIMATION OF NITRIC AND ACETIC ACIDS.

By J. H. Gladstone, F.R.S.

A good method for estimating the amount of nitric acid present in its compounds, or in mixtures of salts, has long been a desideratum. That which I propose bringing before the notice of the British Association is one which I have frequently made use of; and although it does not give rigidly accurate results, I have found it sufficiently exact for most purposes.

The process is as follows:—Place a weighed portion of the substance to be analysed in a small tubulated retort, and dissolve it in a little water. It will be remembered that all neutral nitrates are soluble; the few sub-nitrates which are insoluble in water should be reduced to a very fine powder. Add to the solution in the retort a large quantity of strong sulphuric acid, very many times more than is requisite to effect the decomposition of whatever nitrates may be present. Attach to the beak of the retort, in such a way as to preclude the escape of any gas, a receiver containing water and a considerable quantity of carbonate of baryta. Heat the liquid in the retort gently at first, but more strongly towards the end of the operation. The nitric acid of course distils over, and will be condensed wholly in the receiver, which, together with the neck of the retort, should be kept cool. There it will decompose the carbonate, forming nitrate of baryta, while the liquid will be ever ready to absorb or receive fresh increments of acid. The distillation should be continued till the sulphuric acid itself rises in vapor, sweeps down the nitric acid which may be adhering to the neck of the retort,

and shows itself in the receiver by the production of a dense white cloud, from its decomposing some of the nitrate of baryta in solution. This decomposition is of no moment, as the nitric acid thus set free immediately decomposes in its turn an equivalent of the carbonate of baryta. The liquid must be boiled in order to agglomerate the sulphate, and to cause the deposition of any carbonate of baryta that may be dissolved by the free carbonic acid. After filtering away the sulphate and undissolved carbonates, a clear solution of pure nitrate of baryta is obtained. This may be evaporated to dryness and weighed; or, as the salt is rather apt to decrepitate when heated, it will be found preferable to convert the nitrate into the sulphate, and from that to calculate the amount of nitric acid which passed over into the receiver.

The points which require special notice in this process are,—1st, the purity of the sulphuric acid employed; as commercial sulphuric acid frequently contains a trace of nitric acid, it must be tested before it is used; 2nd, the gentle heating of the mixture in the retort, when there is a good deal of nitric acid in it, in order to prevent any chance of the formation of nitrous fumes; 3rd, the long-continued heating of the liquid, so as to ensure the distillation of as nearly the whole of the nitric acid as possible. The liquid should scarcely be allowed to boil, lest some portion of a salt should spring over, which, whatever it was, if soluble, would vitiate the experiment. When these precautions are properly attended to, a very good result is obtained. Known weights of pure nitre were tried; the amount of nitric acid found was not 1 per cent. less than the theoretical amount. Very small quantities of nitric acid, combined with other matters, can be determined with considerable accuracy in this way, as was proved when 0·2 gr. of nitre was mixed with phosphate and sulphate of copper and soda, and subjected to the same treatment.

It is self-evident that this process cannot be employed when there is some other acid mixed with the nitrate, which is volatile, and gives a soluble baryta salt; or, rather, the process would require to be modified to suit the particular case, and such modifications can generally be easily devised.

It will also be evident that this process may be applied equally well to a number of other volatile acids. Most of these however

may be estimated by simpler methods. Yet it is valuable as applied to acetic acid, a quantitative determination of which is often a matter of great difficulty. Its applicability to this has been proved by direct experiment. The process is identical with that previously described. The plan suggested does not involve any new principle, but is brought forward merely as a fair mode of overcoming one of the most common practical difficulties in analytical chemistry.—*Chem. Gaz. Oct.* 1854.

ON THE COMPOSITION OF TANNIC ACID.

By A. Strecker.

It appears from my experiments, that tannic acid and the tannins in general are much more complex bodies than is generally supposed. In fact, by the action of mineral acids, of alkalies, or of ferments, they are resolved into glucose and a new acid by fixing the elements of water. This resolution, which I announced two years ago, has served me as a starting-point in the determination of the molecule of tannic acid.

According to the analyses of Pelouze, Liebig and Berzelius, the molecule of tannic acid is expressed by the formula C^{18} H^{8} O^{12}, and it is supposed that in its neutral salts 3 equivs. of water of this formula are replaced by 3 equivs. of metallic oxide. There is nevertheless only one tannate (that of lead) which appears from analysis to contain the carbon and metal in the proportion of 18: 3 equivs.

Perceiving from the splitting of tannic acid into glucose (C^{12} H^{12} O^{12}) and gallic acid (C^{14} H^{6} O^{11}) that the above formula could not express the molecule of acid, I undertook a series of experiments to determine the true formula of tannic acid: of these I now lay the results before the Academy.

To obtain tannic acid in a pure state, I purified the acid prepared by the method of M. Pelouze, in two ways; one portion was dissolved in pure ether and the solution precipitated by water, the other portion was dissolved in water and precipitated by ether. Under these conditions two or three distinct strata are obtained, of which the heaviest consists of tannic acid, dissolved in the etherial fluid. This syrupous liquid was dissolved in water and

then evaporated *in vacuo;* the residue was analysed after being dried at 258° F. Ten analyses made with oxide of copper in a current of oxygen gas upon substances obtained at seven different preparations, gave results leading to the formula $C^{54} H^{22} O^{34}$.

	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	Calculated.
C	52·5	52·2	52·2	52·2	52·2	52·3	52·1	52·2	52·3	52·3	54 = 52·4
H	3·8	3·8	3·7	3·7	3 6	3·9	3·8	3·6	3·7	3·5	22 = 3·6
O	—	—	—	—	—	—	—	—	—	—	34 = 44·0

According to this formula, the resolution of tannic acid into gallic acid and glucose may be represented by the following equation

$$C^{54} H^{22} O^{34} + 8HO = 3\,(C^{14} H^{6} O^{10} + C^{12} H^{10} O^{10}$$

This equation is confirmed by the quantities of the two compounds obtained by the decomposition of tannic acid. The former was found to be 87 per cent. (maximum) by Wetherill; of glucose I have obtained as much as 22 per cent.

The quantity of water which may be displaced by metallic oxide in the molecule $C^{54} H^{22} O^{34}$ I have determined directly by digesting tannic acid with oxide of lead, and the analysis of the neutral and basic salts. By the former method I found that the acid loses 4·4 per cent., or 3 equivs. of water, which is confirmed by the analysis of the salts of lead prepared by precipitation, in which the composition of the anhydrous acid is represented by the formula $C^{54} H^{19} O^{31}$, differing by 3 equivs. of water from the formula $C^{54} H^{22} O^{34}$. The precipitates obtained by tannic acid and acetate of lead contain from 3 to 10 equivs. of oxide of lead, in proportion to C^{54}. The analysis of tannates made by Pelouze, Liebig, Berzelius, Mulder and Büchner, agree with the new formula of tannic acid, if we suppose that some salts do not lose all their water at 212° F., or that they were not completely dried.

According to Berzelius, tannic acid combines with sulphuric or muriatic acid, and, when these acids are added to a solution of tannic acid in water. In these cases precipitates are obtained which are dissolved at the commencement, until the fluid contains an excess of sulphuric or muriatic acid. These compounds are distinguished from the conjugate acids, as the mineral acid can be separated therefrom by salts of baryta or silver. The analysis of these precipitates shows that they are nothing but tannic acid

imbued with the acid liquor in which they are deposited. In fact, this sulphuric tannin only contains from 2 to 4 per cent. of sulphuric acid; and the muriatic tannin, when placed *in vacuo* over quicksilver, loses its muriatic acid completely. Moreover, these precipitates differ in no respects from tannic acid, which has been acidulated with a mineral acid. The formation of a precipitate by a mineral acid in a solution of tannin is therefore perfectly conformable to the precipitation of the same solution by chloride of sodium and other alkaline salts, and even by ether, and must be explained by a diminution of the solubility of the tannin in consequence of the change in the solvent.

Gallic acid, which, according to some chemists, contains in the formula C^{11} H^6 O^{10} 4 or 2 equivs. of water, is, from my analysis, a tribasic acid; and the yellow lead salt, regarded by Liebig and Büchner as a neutral salt, and represented by the formula

$$4PbO . C^{14} H^2 O^6,$$

is a basic salt, which, when dried at 248° F., has a composition represented by the formula

$$4PbO . C^{14} H^3 O^7, \text{ or } 3PbO . C^{14} H^3 O^7 + PbO.$$

In fact, five analysis performed with materials prepared at different times gave 75·9 to 76·1 per cent. PbO; numbers which approach much more closely to the latter formula than to that of Liebig and Büchner.—*Chem. Gaz. Oct.* 1854, *from Comptes Rendus*, July 3d, 1854, p. 49.

ON THE MOLECULAR CONSTITUTION OF TANNIN AND GALLIC ACID.

By M. E. Robiquet.

In my last investigation on gallic acid fermentation, I have left undecided the question as to whether tannin is a simple isomere of gallic acid, or a combination of gallic acid with a hydrocarbon similar to sugar or gum. The following facts which I had observed, were not sufficient to decide the question. Whatever method is adopted for converting tannin into gallic acid, the transformation is never complete; a part of the tannin is altered and converted into an amorphous and mucilaginous substance possessing some of the properties of the gum. If we operate by

means of fermentation, this substance is found in the liquors, but if the conversion is effected by means of diluted sulphuric acid, a substance similar to humic acid is produced at the same time as the gallic acid, and we are naturally led to think that the sulphuric acid has resolved the tannin into gallic acid and a gummy substance which is afterwards carbonized. It may be added that by no process, whatever care may be taken, is it possible to produce a quantity of gallic acid that shall be more than half the weight of the tannin employed. This last fact, the uniform result of experiments, is much relied upon by those Chemists who believe in the pre-existence of gallic acid in tannin, in the same way as benzoic acid is supposed to exist in hippuric acid. The formula for tannin assimilates to that for gallic acid dried at 212° Fahr., consequently, if the latter is but an isomeric transformation of the former, the product obtained in gallic acid should at least weigh as much as the tannin used. I say at least as much, because, as the transformation takes place in water, the gallic acid obtained is more highly hydrated than that dried at 212°.

But on examining the facts more closely it is found, that in converting tannin into gallic acid it is impossible to avoid the decomposition of a large portion of the former, and it is evident that the tannin is changed as a whole, and is not split in two. When once it is thus modified the tannin is no longer susceptible of conversion into gallic acid, but it is transformed into an amorphous mucilaginous substance. It is on this account that the gallic acid made by Scheele's process is not even equal to half the weight of the tannin contained in the galls used. For the same reason, also, the tannin, already in an altered state, contained in oak bark, yields no gallic acid.

The following experiments appear to me to confirm these views:—

An aqueous solution of pure tannin was submitted, in a close vessel, to the action of pectase, at a temperature ranging from 77° to 86° Fahr., for eight days. The small quantity of tannin not yet attacked at the end of this time was precipitated with gelatine, and the gallic acid with neutral acetate of lead. After standing for twenty-four hours, the complex precipitate was completely separated from the supernant liquor, which was clear and colorless.

This liquor was tested with Soleil's polarising apparatus, but there was no sensible change in the color of the doubly rotating plate, clearly indicating that there was not the smallest quantity of sugar or of gum present. To be still more certain, I decomposed the acetate of lead contained in this solution with sulphuretted hydrogen, and after filtering it, carefully evaporated the clear liquor. There was no residue left after the evaporation, although I used 200 grammes of liquid.

Thus it would appear that tannin does not contain sugar nor gum, nor any other similar principle, in combination with the gallic acid. When, under the influence of the pectic fermentation, or of sulphuric acid, tannin is transformed into gallic acid, there occurs a simple molecular change, accompanied by hydration, just as cane sugar under the influence of yeast is transformed into grape sugar, before its conversion into alcohol and carbonic acid.

It remains for me to confirm this view of the subject by a minute analysis of all the tannates and gallates which can be obtained of constant composition.—*London Pharmaceutical Journal from Journal de Pharmacie.*

ON THE OCCURRENCE OF TANNIC ACIDS IN WOODY PLANTS, AND THEIR CONNEXION WITH THE FORMATION OF WOOD.

By Prof. Pettenkofer.

Some years since, Pettenkofer stated that wood vinegar contained pyrogallic acid. Further investigations have shown, that the pyrogenous acid contained in wood vinegar does not behave exactly like pyrogallic acid. Pettenkofer has now found the means of isolating the acid from the wood-vinegar.

The residue of the distillation of wood-vinegar is treated with a concentrated solution of chloride of sodium or of some other salt. The pyrogenous acid dissolves in this, whilst the intermixed resinous matters remain. The acid is then extracted by ether, which leaves it almost in a pure state on evaporation.

This acid is obtained not only by the dry distillation of bark, but also by that of wood; and the quantity of acid is not diminished even when the wood, before distillation, is very finely divided and treated with the usual solvents, even solution of potash.

Hence the author concludes, that this acid is produced from one of the insoluble matters of the wood, from some substance which no doubt stands in near relation to tannic acids, and which is perhaps produced from this in the course of vegetation, or, on the contrary, may furnish the material for its formation.

Starch and cellulose are not the sources of this pyrogenous acid, for straw, paper, and starch do not furnish it on distillation. It appears, therefore, that one of the substances incrusting wood furnishes the material for this pyrogenous acid.

A more extended investigation of the distribution of the tannic acids in the vegetable kingdom, which is not yet completed, has already led the author to the result that the tannic acids exist in perennial, but not in other plants, which certainly indicates a close connexion with the formation of wood. *Potentilla tormentilla* and *Solanum dulcamara*, which are perennial plants, contain tannin; the annual species, *Potentilla anserina* and *Solanum tuberosum*, contain none.—*Chem. Gaz., from Buchner's Neues Repertorium*, iii. p. 74.

ON THE CONSTITUTION OF COAL-TAR CREOSOTE.

By Prof. Williamson.

For some years past it has been a debated question among chemists, whether the peculiar body orginally described by Reichenbach as creosote, and subsequently analysed by Ettling and others, has any real existence, or whether the properties which were attributed to it are not to be more correctly ascribed to the hydrate of phenyle, which can be obtained in a state of great purity from at least one sort of commercial creosote by mere distillation, and which possesses in an eminent degree the antiseptic properties for which creosote is remarkable.

With a view of obtaining some light on this question, Mr. Fairlie undertook, in the laboratory of University College, an investigation of the portions of coal-tar creosote which boil higher than the hydrate of phenyle. The result of his experiments has been to show that a body homologous to hydrate of phenyle may be obtained from the crude creosote, in fact the next term of the series above hydrate of phenyle itself. Some qualities of commercial creosote

contain a greater quantity of this *hydrate of cresyle* (as it may be termed) than others; and it is most advantageously prepared from those portions which in the first distillation come over between 200° Cent. and 220°. After a great number of fractional distillations, a colorless, highly dispersive liquid is obtained, boiling at 203° Cent., and possessing the composition represented by the formula $C^{14}H^{8}O^{2}$.

This hydrate of cresyle resembles the corresponding phenyle compound in most of its properties; but it may be easily distinguished from that compound by its almost complete insolubility in aqueous ammonia.

When gradually mixed with sulphuric acid, it becomes of a beautiful rose-color, and gives rise to sulpho-cresylic acid.

The action of nitric acid upon hydrate of cresyle is very violent, and almost explosive if the acid is used in a concentrated state and at so high a temperature as the common atmospheric; even very dilute nitric acid transforms the compound into a brown tarry mass from which no definite substance can be extracted. By cooling some nitric acid in a frigorific mixture, and allowing some similarly cooled hydrate to fall into it drop by drop and with constant agitation, a red colored solution was obtained, which by dilution with water, and subsequent neutralization by potash, yielded a crop of short needle-shaped crystals of an orange-red color and possessing a greater solubility in water than the salt of carbazotic acid. This salt was found by analysis to possess the composition of a homologue of carbazotate of potash; so that it is the potash salt of a hydrate of cresyle in which three atoms of hydrogen are replaced by hyponitric acid,

$$C^{14}\begin{matrix}H^{4}\\O,\ KO\\(NO^{4})^{3}\end{matrix}$$

The same acid was obtained by the action of nitric acid upon an alcoholic solution of the hydrate containing urea; but in attempting to repeat this experiment on a larger scale the mixture became hot, and the whole of the substance was destroyed with almost explosive violence.

When treated with pentachloride of phosphorus this hydrate of

cresyle is decomposed in like manner with the hydrate of phenyle, as described by Mr. Scrugham, yielding a chloride of cresyle and a phosphate of the same radical.

By the action of this phosphate in an alcoholic solution of acetate of potash, a peculiar oleaginous body is obtained, possessing an odor entirely different from that of the hydrate, and decomposable by potash with production of acetate and cresylate.

A similar reaction ensues when the phosphate is distilled with ethylate of potash, and a cresylate of ethyle is thus obtained.

In the numerous distillations which were performed for the purification of the hydrate of cresyle, some circumstances were observed which led to a suspicion that the body undergoes a change of composition, either through the distillation itself, or by some influences accompanying it. These circumstances were,—1st. A tarry residue, from a liquid which when introduced into the retort was perfectly colorless. 2nd. The formation of a small quantity of water in the commencement of such a distillation, though none was contained in the substance used. 3d. The gradual lowering of the boiling-point of the whole liquid by a great number of distillations. These facts, taken in conjunction, naturally suggested that the oxygen of the air contained in the retort might act upon the substance, and thus gradually reduce it to hydrate of phenyle.

In order to test the correctness of this hypothesis, the atmospheric air was expelled from the distilling apparatus by dry hydrogen gas, and the distillation performed in a pure atmosphere of this gas. A great number of distillations performed in this manner were at exactly the same temperature, and all the other anomalies were simultaneously removed. It was however found that the liquid always boiled at a lower temperature in hydrogen than in atmospheric air, the difference being about 2° Cent., and this without any alteration of the pressure on the surface of the boiling liquid. A similar fact was noticed in the distillation of hydrate of phenyle, and also of some other liquids.—*Chem. Gaz., Oct.* 2, *from Proc. Royal Society, June* 15*th*, 1854.

THE ACTION OF IODIC ACID UPON THE VEGETO-ALKALIES.

(A communication made by R. H. Brett, Esq., Ph. D. to the Liverpool Chemists' Associations, May, 1854.)

Dr. Brett said his attention was first drawn to the subject, by endeavoring to find out some test which should readily detect the presence of quinidine in quinine; on this point he had come to the conclusion that there was no decisive test, but knowing the peculiar action of iodic acid upon morphia, the production of a brown color from the liberation of iodine, he thought there might also be some reaction with quinine or any of the other alkaloids. Acting upon this impression he had made a number of experiments, which had resulted in showing most conclusively, he believed, that the reaction of iodic acid with nitrogenized vegeto-alkalies, was such as to distinguish them from all other organic substances. In the first place, he said, he would show its action upon a few of the alkaloids, and afterwards, its action upon other azotized and non-azotized substances, from both the vegetable and animal kingdoms, when a very marked difference in the results would be seen.

The doctor then placed a small portion of quinine in a capsule, and added about an equal portion of iodic acid, with a few drops of water. This mixture, on being gently heated, gave rise to a series of distinct explosions, accompanied by an evolution of gas, and it was to these explosions he wished to draw attention, for no other substance that he had experimented upon would produce them except the alkaloids. He repeated the experiment several times, substituting for the quinine, the alkaloids, strychnia, morphia and narcotine, and in each case with the same results. He then showed its action upon other—both azotized and non-azotized—substances, not alkaloids, such as meconic acid, salicine, uric acid, gluten, &c.; but there was no explosive action or the slightest appearance of detonation, merely a calm liberation of iodine vapor.

He observed, he had experimented with solutions of iodine itself, but without any result, though he would not insist upon this with much force, as only a few experiments had yet been made; but as far as they had gone no explosive action had been observed. He had also mixed iodic acid with ammonia, but with-

out any result. With regard to the theory of the decomposition which took place, and the cause of these explosions, his impression was that iodide of nitrogen was formed, but even its formation must be looked upon as an extraordinary circumstance, when we bear in mind the small quantity of nitrogen contained in these alkaloids; and what is more extraordinary still, the inability of any other nitrogenized body to produce the same reaction. If this explosive property should be shown to belong, by further experiment, as he had no doubt it would, exclusively to the alkaloids, it would be an important addition to our knowledge of these powerful medicinal agents; for instance, if we treat an unknown white substance with iodic acid, and get no explosion, we can say at once, that body is not one of the alkaloids, and as far as he had tried experiments upon the salts of the alkaloids, which were upon sulphate of quinine and muriate of morphia, he had found the reaction the same as upon the alkaloids themselves.—*Pharm. Jour.*, Nov. 1854.

ON THE PURIFICATION OF COAL NAPHTHA, AND OTHER VOLATILE HYDRO-CARBONS CONTAINING BENZINE.

By Professor Calvert, of Manchester.

Professor Calvert finds that pure benzine and some of the volatile hydro-carbons obtained by the dry distillation of bituminous coals and shales, which also contain benzine, possess, to a high degree, the property of dissolving fatty or oily matters, and proposes to apply this property of benzine to various useful purposes.

In order to render the various products that contain benzine suitable for their several applications, he submits them to the following treatment, the object of which is to destroy or remove some of the carburetted hydrogens which are mixed with them, and which, not being sufficiently volatile, interfere with the application of benzine.

To effect this he takes coal and shale naphthas, preferring the limpid coal naphtha of commerce, and puts it into a suitable earthenware or leaden vessel, and adds to it sulphuric acid in small quantities until no more coloration is produced; consequently the quantity of acid employed will vary with the relative

degrees of purity of the coal or shale naphtha. The naphtha so treated is then washed with pure water or with a solution of an alkali, and submitted to distillation in an ordinary still. These operations are repeated until it is sufficiently pure for the various purposes to which it may be applied. For certain purposes on a large scale, it is only necessary to take a commercial coal naphtha and distil it at a temperature which does not exceed 212° Fahrenheit.

This benzine, or purified coal naphtha, is applicable to the removal of fatty or oily matters from animal and vegetable substances.—*Annals of Pharmacy*, Nov. 1854.

ON SPIRITUS ETHERIS NITROSI AND NITRIC ETHER.

By Dr. F. Mohr.

When nitric acid, water and alcohol, are distilled with one another, a reaction ensues, in consequence of which the liquid continues to boil after the removal of the fire. The nitric acid is deoxidized; nitric oxide, the vapor of aldehyde, and carbonic acid, are evolved, and in the residue several oxygenated bodies, particularly oxalic acid, remain. The distillate contains, as the chief product, the ether of nitrous acid, which is commonly termed nitric ether. The nitrous ether is obtained from all proportions of alcohol, and nitric acid, particularly, by strong dilution. On the contrary, by strong concentration of the acid an explosive decomposition readily results, and, with strong excess of alcohol, the latter passes over in a pure condition. The preparation of nitric ether is divided into two parts, namely, its production and rectification.

The production of this ether ensues when nitric acid, alcohol, and water are heated, and the volatile products pass over themselves by the heat of the reaction. By these means it happens that the ether distils over as free as possible from alcohol, which does not occur when the formula of the Prussian Pharmacopœia is followed, as from the large quantity of strong spirit there ordered, the spirit passes over at first alone, and the formation of ether commences only when a large portion of the alcohol has already distilled over.

Mohr found, by experiments on the preparation of this ether,

that the employment of copper cuttings, recommended by Kopp, was serviceable, and gives the following directions for the preparation of the officinal ether.

Twenty-four ounces of spirit of wine, specific gravity, .833, are mixed with the same quantity of nitric acid, specific gravity 1.2, and then 4 ounces of copper cuttings are added. From the mixture 24 ounces are drawn over, which are mixed with a little tincture of litmus, and a solution of soda or potash is added gradually, until the distillate acquires a blue color. From this distillate 8 ounces are now drawn over and mixed with 16 of the strongest spirits of wine, by which the product equals the quantity of spirits originally used. The preparation thus obtained free from acid should be kept in two or three ounce bottles quite full. This spirit of nitric ether is of a slight yellow color, extremely powerful, and of a pure odor, and in all cases more so than pure spirit of wine.

The Prussian Pharmacopœia requires a spirit of nitric of specific gravity .820—.825. This is a great error, because, in consequence, the spirit of nitre is unquestionably deteriorated. When the pharmaceutist obtains a product which has not this specific gravity, he can only produce it by the addition of strong spirit, by which the contents of nitric ether are diminished.

Further, when, according to the Pharmacopœia, nitric acid, diluted with eight times its quantity of alcohol, is distilled, pure spirit of wine at first passes over, and only towards the end the yellow strongly odorous product comes over. But, on the contrary, when the distillate is rectified, the latter goes over at first, and the spirit of wine at last; therefore it is incomprehensible why the Pharmacopœia directs the first ounce to be rejected.

From these circumstances, Mohr concludes that it is very fallacious to remove the small quantity of free acid, which the ether always exhibits after a time, by repeated rectification, as the changes which spirit of nitre thereby undergoes occasion much more evil consequence than that which arises from the presence of a little free acid.

In the officinal spirit of nitre, the nitric ether is obtained mixed with alcohol and water. In the distillate obtained from copper so much nitric ether is obtained, that when this is once rectified, and one-third drawn over, from this third part the

nitric ether can be separated by agitation with a solution of chloride of calcium. From 48 ounces of spirit of wine 8 ounces of nitric ether may be separated in this way, which rectified over dry chloride of calcium will give pure nitric ether. The yellow color depends upon a body mixed with the ether, which cannot be removed by rectification over sugar, as stated by Couerbe, but a portion may be obtained colorless by fractional distillation.

The ether of specific gravity .898 begins to boil at 63.5° Fahr., and boils completely at 64.4°. Nitric ether is the only ether which is obtained considerably in a diluted watery fluid, and the only one which is not formed in a concentrated fluid, by the power of muriatic acid or sulphuric acid to abstract water, and, moreover, the only one which results by a decomposition of its acid, and simultaneously with the oxidation of the alcohol. The latter abnormity does not happen when nitrous acid, instead of nitric acid, is directly employed. Nitric ether prepared according to Kopp's method, and the previously known ones, always contains aldehyde. By its decomposition with caustic potash or soda this liquid acquires a brown red color. Nitrous ether can be kept for months in contact with potash, without undergoing decomposition; but the author has again obtained the alcohol by the treatment of this ether with potash ley in closed tubes; nevertheless, he infers that it cannot be regarded as the nitrate of ethyl-oxide, but must be considered as $NC_4 H_5 O_4$.—*Annals of Pharmacy, from Buchner's Repertorium.*

ON EMULSIONS OF THE GUM-RESINS AND RESINS.

By M. Constantin.

Up to the present time the gum-resins and resins have been but rarely employed, on account of the difficulty of mixing them with liquids for administration. The purification of these substances, even by means of vinegar or alcohol, has been rejected; for, as Lemery very justly remarks, it is preferable to choose gum-resins and resins free from impurities, than to purify them by any means whatever. In Pharmacy we have only the alcoholic solutions of gum ammoniacum and assafœtida, and the alcoholic and ethereal solutions of tolu, which substances I have most carefully examined, and all of which, when added to an aqueous liquid, very

rapidly separate, the resins floating and uniting on the surface of the liquid. But when, as is frequently the case, we have to prepare a mixture or injection containing any of the gum-resins, gum ammoniacum or assafœtida, for instance, or a resin, more especially that of tolu, which mixes very incompletely, it is, I think, of some importance to obtain a more ready and advantageous process for their admixture than any of those hitherto employed for this purpose. Among those mentioned in works on Pharmacy we find the use of mucilage, or what is preferable, the yolk of egg; but these means, although very good in themselves, become tedious when adopted in hospitals, where, in a short space of time, a large number of mixtures have to be prepared; and even when yolk of egg is used, the resins above mentioned are frequently but imperfectly mixed.

Having frequently had occasion to see the gum-resins prescribed, and among them that of assafœtida, which, as is known, is a very energetic medicine, I endeavored to find some means of shortening the process of trituration; and I think that the process I am about to describe will be a considerable saving in point of time, and also be more efficacious for mixing the gum-resins and even the resins. The gum-resins will, in the first instance, claim attention, for the remarks I have to make on the resins are but a confirmation of the first-named process.

Having been called upon on several occasions to prepare mixtures and injections in which gum ammoniacum and assafœtida were used, the following was the method I employed for their preparation :—

I place the quantity of gum-resin prescribed, in small pieces, in a marble or porcelain mortar, and add about four times its weight of alcohol. I then ignite the alcohol and triturate the whole with a porcelain pestle until the alcohol has all burned away. The gum-resin acquires the appearance of a soft extract. The liquid is now added in small quantities at a time, and a perfectly homogeneous emulsion is produced, from which no separation takes place on standing, and in which the gum-resin is very completely distributed, a result which it is difficult to ensure when yolk of egg is used, even after long trituration. In this way the gum-resin is presented to the absorbent surfaces of the stomach

and intestines more effectually than it would be in the form of pill, and the action of the medicine is therefore more certain.

When the quantity of gum-resin prescribed is very large, the addition of yolk of egg will improve the emulsion, by preventing reunion of the resinous portion. A small quantity of powdered gum-arabic might also be added to the gum-resin after the combustion of the alcohol has ceased, in order to render the emulsion more perfect, but this would generally be an unnecessary precaution.

The resins afford results equally satisfactory. It is only necessary to add to them what they require to convert them into gum-resins, and powdered gum-arabic answers this purpose. To the resin, balsam of tolu, for instance, twice its weight of gum-arabic is to be added, not forgetting the alcohol in the same dose as before, the mode of operating being also the same as for gum-resins. Balsam of tolu may be thus perfectly suspended, forming an emulsion, the taste of which is very agreeable, and has nothing repugnant to the patient.

As these processes are not described in any work on Pharmacy, I thought they might be deemed worthy of the notice of Pharmaceutists, being simple and expeditious, and affording satisfactory results.

The heat produced by the combustion of the alcohol over the gum-resins and resins, is not sufficient sensibly to alter the qualities of the product, for although some of the aromatic principles of the medicine must be volatilized, the quantity appears to be very small, the peculiar taste and odor remaining apparently undiminished in the emulsion. The loss must be considered as almost nothing.—*London Pharm. Jour., from Journal de Pharmacie.*

ON THE PREPARATION AND USE OF PERCHLORIDE OF IRON.

By M. Gobley.

Perchloride of iron had been almost abandoned as a therapeutic agent, when M. Pravaz, a distinguished surgeon at Lyons, proposed a new mode of applying it in the treatment of aneurism and varicose veins, which consists in injecting into the arteries or veins a few drops of a concentrated solution of the salt.

Under the influence of this liquid all the blood within a distance of three or four centimetres is converted in a few minutes into a solid clot. This new mode of treatment, however, is only now being tested.

It has not yet been determined what is the real mode of action of perchloride of iron in the blood. According to some, it coagulates the whole of the blood and all its elements. According to others, it acts only on the fibrine, and others again contend that its action is confined to the albumen.*

It still remains to be shown what is the nature of the clot, whether the perchloride is a simple hemostatic or a hemospasic, whether it acts as an irritant caustic or as a toxic agent, and, moreover, what is the maximum dose that can be safely applied.

It will be seen from these questions, which have been recently discussed in the Academy of Medicine, that some importance attaches to the preparation of perchloride of iron. M. Burin de Buisson, who made, with M. Pravaz, the first experiments with the new mode of treatment to which reference has been made, prepared in the following manner the chloride which they used. Peroxide of iron, previously heated to redness, was digested without heat for five or six hours with colorless and pure hydrochloric acid; the mixture was then heated over a water-bath, until about two hundred parts of the oxide were dissolved in 1000 parts of acid. The process should be conducted with a porcelain capsule the weight of which is known. The liquid having been decanted from the undissolved oxide was carefully evaporated over a water-bath, stirring it continually until it acquired the consistence of a thick syrup, the weight of which was determined. This was mixed with half its weight of distilled water, heated for a short time, and then filtered. The capsule and filter were washed with a quantity of water equal to that previously used, and the whole subsequently brought to the density of 43.5° or 44°.

The chloride prepared in this way is subject to the objection

* M. Burin du Buisson has ascertained that ten drops of solution of perchloride of iron, of 45°, added to the white of an egg diluted with thirty grammes of water causes the whole to become, in fifteen seconds, a mass which, on inverting the vessel in which it is contained, remains adhering to the sides, and will not fall out for some time.

of its retaining too much free hydrochloric acid. If, instead of stopping the evaporation at the point indicated by M. Burin du Buisson, it be continued for a longer time, it becomes still more acid. It is known also how difficult it is to keep for any length of time a solution of perchloride of iron with the deposition of insoluble oxychloride and the development at the same time of free acid in the solution.

In order to obviate these objections, M. Burin du Buisson proposed, in a new memoir addressed to the Academy of Sciences, to substitute the following process for that already described:

Pure hydrochloric acid is to be saturated as far as possible with hydrated peroxide of iron; the solution is evaporated over a water-bath, taking care to remove the aqueous vapors, as I had before indicated, as these cause the formation of hydrochloric acid and the deposition of oxychloride of iron. When the liquid has thus acquired the consistence of a thick syrup (in this state it crystallizes on being cooled, without, however, assuming a solid mass), the evaporation is stopped, and an excess of gelatinous hydrated peroxide of iron mixed with a little water is added; they are stirred together for a quarter of an hour, and then allowed to stand for several hours. Sufficient distilled water is added to make the density equal to 30° Baumé, and it is then left in contact with excess of hydrated oxide for eight days when it is filtered, and again allowed to stand for fifteen days. The density of 20° Baumé, is that which MM. Valette, Desgranges, and Petrequin prefer for the treatment of varicose veins. For aneurisms these surgeons think it is sufficient to employ a solution at 20° or even 15°.

This new mode of preparing the ferric solution has no material advantage over the former. The contact of the liquor with hydrated oxide of iron does not remove free hydrochloric acid so effectually as evaporation, as M. Burin du Buisson has himself admitted. It is known that solution of perchloride of iron, even when made from the sublimed chloride, has always an acid reaction.

If it be impossible to prepare a solution of perchloride of iron without its being acid, and if it be important that it should be as little acid as possible, would it not be preferable to have recourse to the chloride of iron prepared by the process which I

described in 1844.* The ferric solution would then be a preparation which the surgeon could prescribe of any strength he may desire. The dry chloride may be kept for a long time without change; it forms a clear solution with water; which also may be kept for a long time without any sensible alteration. The chloride of iron prepared from hematite (according to M. Gobley's process referred to) is chemically more pure and more surely uniform than that made from the hydrated oxide. It also contains a smaller quantity of free acid. I believe, indeed, that it contains but a mere trace. If, in preparing it, the evaporation be continued beyond the point at which it becomes solid on cooling, I have observed that it decomposes into hydrochloric acid and oxychloride of iron. The solution which Mr. Burin du Buisson now prefers to use is but slightly acid when recently prepared, but it becomes more acid after being kept, from the deposition of oxychloride. It is true that, according to him, it is this excess of acid that prevents a further deposition of oxychloride, but in order to prevent the acidity of the liquor, would it not be better to employ a solution made extemporaneously from the dry chloride?

There is, it is true, one difficulty in the employment of the dry salt, namely, that the quantity of the solution required for an operation is always very small, but I have surmounted this difficulty by determining from experiment the proportions of perchloride of iron and water necessary to form solutions of the strength required for surgical purposes.

The following are the proportions for making solutions of certain densities indicated according to Baumé's hydrometer:—

Chloride.	Water.	Density of solution.
53.85	46.15	45°
34.65	65.35	30°
21.30	78.70	20°
16.35	83.65	15°

The dry chloride contains about a fifth of its weight of water it is, therefore, always easy to calculate the quantity of anhy-

* This process is described at length in vol. iv., page 24, of the *Pharmaceutical Journal*.

drous chloride in the solutions. Thus those of the densities, indicated by 45°, 30°, 20°, and 15° respectively, contain 43.10,—29.70,—17.05,—12.10 per cent.—*Pharm. Jour., from Journal de Pharmacie.*

ON THE MODE OF PREPARATION OF THE OLEA COCTA.

(Translated by J. M. Maisch.)

The so-called olea cocta, like several ointments, are prepared according to some Pharmacopœias, of even recent edition, from the fresh herbs, by boiling them with oils or lard until all moisture be evaporated. L. Hermite (J. de Pharm. et de Chim. Nov. 1853, 349) remarks correctly that this practice embraces all the unfavorable conditions. The oil or fat, being exposed at the same time to a heat of at least 212° and the vapors of water, often for several hours, is very apt to spoil; even the herbs, which cannot become saturated with the oil before the water is entirely driven off, suffer a change; by the coagulation of the albumen in the juice, the other matters to be extracted will be enveloped and prevented from receiving the solvent action of the fats, at least partly; and from the fresh herbs these preparations cannot be made at all seasons.

Two phases must be distinguished in this mode of preparation from the fresh herbs: 1st, the drying of the vegetables within a heated liquid; and 2nd, the digestion of the same in the same liquid. It is only in the second period that the oil has really a useful action upon them, the first period may advantageously be replaced by previously drying the herbs in open air, when they will better retain their peculiar properties, and the necessity be removed of heating the fat too long and to too high a degree.

L. Hermite has prepared several oils and ointments for comparison, from fresh and from dried herbs, the quantity of the last being that obtained from the given quantity of the first, after the drying process. In all cases the dry herbs have made a much better preparation, as far as could be judged from the external appearance. It is advantageous to put the air-dry herbs for an hour in the drying room before extracting them with oil. Then they become so friable that by rubbing them between

the fingers they may be easily reduced to a coarse powder, which readily absorbs the oil. In the heat of the water bath all the oil soon becomes green, and when after one or two hours, according to the quantity employed, the fat has extracted all color, the operation may be looked on as finished. In this manner the olea cocta, which ought to be called now olea infusa, are prepared by the Pharm. Wurttemb., and as we understand the Pharm. Bavaria, which is to be published in a short time, will adopt the same process.

Some pharmaceutists have chosen to obtain these oils by displacements from the dry herbs. E. Krause (Zeitschr. J. Pharm. 1853, No. 7,) reduces the herb, previously dried in a moderate heat, to a coarse powder, moistens it with strong alcohol, in sufficient quantity to press it down, and after letting it stand full a day, well covered, transfers it to a percolator, pouring upon it the right quantity of oil. After the oil has been all absorbed by the powder, he puts a layer of washed sand on top, to displace by water the last quantity of oil, taking care, however, not to get it mixed with the aqueous extractive matter. Thus prepared the oil has the odor of the herb in a high degree, is of a dark brownish green color, and keeps very long without getting rancid.

It is unnecessary to heat the oil, to drive off the alcohol, as after standing it collects on the bottom, and serves to keep the oil from becoming rancid. Small quantities, such as oleum cantharides for ung. canthar. may be prepared in the same way in a suitable funnel. Oil of cantharides is said to become stronger and better if ether or chloroform be used for moistening in place of alcohol.

A similar formula was published by H. Gerste (Zeitschr J. Pharm. 1854, No. 3). One pound troy he moistens with 6 oz. spir. vini rect., and then gradually pours on the necessary quantity of oleum olivarum; the obtained oil is to be heated for a short time in the steam apparatus, till all the alcohol has evaporated and the oil is clear.—*Buchner's N. Repert.* 1854, 223–225.

ON THE PREPARATION OF INULIN.

(Translated by J. M. Maisch.)

C. J. Thirault (Journ. de Pharm. et de Chim. 3 Sér. xxv. 205) remarks on that subject the following:

"It is difficult to obtain Inulin perfectly white and in any considerable quantity. By heating elecampane with boiling water, concentrating the liquor by evaporation to separate the inulin, and treating it several times with charcoal, it may be obtained sufficiently white, but charcoal absorbs a considerable quantity of it."

Much easier it may be isolated in the following way: Elecampane is exhausted by displacement with boiling water in order to obtain a saturated solution and to shorten the evaporation. After sufficient concentration, the double volume of alcohol of 81° (alcoholmeter) is added, precipitating the inulin nearly white. If this be dissolved in a little distilled water, the liquor treated with a small quantity of washed animal charcoal, and again mixed with double its volume of alcohol of 81°, a white precipitate of inulin is obtained, which, being impregnated with alcohol, will dry in a short time.

This method is, notwithstanding the use of alcohol, a profitable one, the alcohol not being lost, but becoming merely diluted.—*Erdmann's Journal* lxii., 253.

ON THE PRESENCE OF GLUCOSE IN OPIUM, LACTUCARIUM, THRIDACE, AND IN THE VEGETABLE KINGDOM IN GENERAL.

By Magnes Lahens, Pharmaceutist of Toulouse.

The author, in the course of an investigation into the composition of commercial opium, met with Landerer's statement that *glucose* is often found in that drug, and is due to the grape juice employed by the Orientals to adulterate it, as he had himself witnessed.

Desiring to ascertain if certain specimens of opium in his possession likewise contained sugar, he submitted fourteen samples to the test by Barreswil's method, and detected it in all of them. He could not believe that they were sophisticated, especially

those known to be rich in morphia, and determined to study them more closely.

It naturally occurred to Mr. Lahens to inquire whether poppy heads do not contain glucose among their constituents? and he found it very soon in the alcoholic extract of the poppy, as well as in the dry and recent poppy heads, notwithstanding that no allusion had been made to its presence before in these, or in opium, where it has probably been confounded with extractive matter.

His experiments do not disprove Landerer's statement, but show that at least a part of the sugar is properly present, and is therefore a sufficient problem to decide how much of the glucose is derived from the poppy. He therefore tested quantitatively the fourteen specimens of opium before noticed, besides four samples of indigenous opium, with the following results, viz :—

No. 1.	Egyptian	opium	contained	6.9	of Glucose.
" 2.	Smyrna	do.	do.	8.0	do.
" 3.	"	do.	do.	7.2	do.
" 4.	"	do.	do.	7.1	do.
" 5.	"	do.	do.	7.6	do.
" 6.	Constantinople	opium	do.	14.5	do.
" 7.	"	do.	do.	4.3	do.
" 8.	"	do.	do.	7.6	do.
" 9.	"	do.	do.	10.0	do.
"10.	"	do.	do.	7.5	do.
"11.	"	do.	do.	8.4	do.
"12.	"	do.	do.	6.4	do.
"13.	"	do.	do.	8.0	do.
"14.	Opium of uncertain origin		do.	3.0	do.
"15.	Indigenous French	opium	do.	6.5	do.
"16.	"	do.	do.	7.5	do.
"17.	"	do.	do.	7.0	do.
"18.	"	do.	do.	8.0	do.

The author remarks that specimens 6, 7, and 14 had been previously found deficient in morphia, and that 7 and 14 bore evident marks of having been remade.

Setting aside the results for these three specimens for the present, it follows :

1st. That the foreign opiums contain nearly an equal proportion of glucose, and that the mean is between 7 and 8 per cent.

2nd. That the mean proportion of glucose in the indigenous specimens was 7.25 per cent.

He therefore infers that the sugar in the specimens 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, is essential to them and not fraudulently added, and as a corollary to this proposition, he considers that all opium which contains much more or much less of glucose than 7 to 8 per cent. ought to be suspected.

The specimens 6, 7, and 14 also support this view, as in the first, glucose has been added as an adulteration, whilst the other two have been remade with other materials.

The analogy between the juices of the poppy and lettuce induced the author to test lactucarium, which on trial he found to contain between 8 and 9 per cent of glucose; and on testing the *thridace* of the shops, he found the proportion of glucose as high as 18 to 20 per cent., which he thinks is one of the causes of its extreme deliquesence.

Mr. Lahens afterwards sought for this variety of sugar in other plants and vegetable products, and the results obtained, though not complete, lead to the belief that it occurs much more generally than has been supposed.

In order to ascertain whether any other ingredient in opium would react with the sugar test so as to cause deception, the author made a series of experiments. First, all the proximate principles of opium were successively put in contact with the test liquid, without any reducing effect. Secondly, one hundred grammes of an aqueous solution of opium was evaporated to dryness, and the dry extract redissolved in water to make 100 grammes. The latter tested with Barreswil's solution gave the same indication as the first, showing that no volatile ingredient was present as the reducing agent. Thirdly, a solution of specimen No. 2 was treated with well-washed yeast, and the resulting liquid yielded alcohol by distillation. Fourthly, he obtained a syrupy liquid from the liquor from which morphia had been precipitated, which, though impure, possessed two thirds of the reducing power of syrup of starch.

The test liquid used was made as follows:—

Take of	Caustic potash,	60 parts.
	Neutral tartrate of potassa,	40 do.
	Distilled water,	200 do.

Dissolve; and then

Take of	Sulphate of copper	65 do.
	Distilled water,	500 do.

Dissolve and mix with the preceding liquid.

Mr. Lahens applies this test to opium by exhausting five grains of the latter with sufficient water to make 50 grains of solution, then places five cubic centimetres of the test liquid in a porcelain capsule, heats it to ebullition, by a small alcohol lamp, and then drops in the opium solution slowly from a graduated burette, so as not to stop the ebullition or increase the liquid above the primitive level. As soon as the liquid acquires a reddish yellow color, the addition should cease, and the number of measures of the solution of opium consumed indicates the amount of sugar present.—*Jour. de Pharm. Oct.* 1854.

ON THE OLEATES OF THE ORGANIC ALKALIES.

By M. L. Hermite.

The author in a paper published in the *Journal de Pharmacie* for Oct. 1854, proposes as a substitute for the oleaginous and glycerinic solutions of the organic alkaloids, recently proposed as liniments, solutions of these bases in *oleic* acid. He objects to the oils from their incapability of dissolving the alkaloids, and to the glycerin from its not possessing unctuous properties.

Oleic acid dissolves the organic alkaloids and their salts perfectly. This acid can be procured without any disagreeable odor, and can easily be aromatized with essences. Its acidity is not so decided as to be of any account in its application to this use. It is sufficient to triturate the alkaloid with a little of the oleic acid to divide it, and then add the rest. The proportion varies with the activity of the substance. The following recipes are given:

Oleate of Morphia.

Take of	Purified Oleic Acid,	an ounce.
	Morphia in powder,	1½ grain.
	Essence of Bergamot,	6 drops.

Mix as above.

It does not do to dilute a solution of morphia in oleic acid with olive oil, as it occasions a precipitate.

Oleate of Quinia.

Take of Sulphate of Quinia in powder,	a drachm.
Oleic Acid, aromatized,	10 drachms.

Dissolve by the aid of a gentle heat.

Oleate of Veratria.

Take of Veratria in powder,	6 grains.
Oleic Acid,	an ounce.

Dissolve.

Oleate of Strychnia.

Take of Strychnia in powder,	3 to 15 grains.
Oleic Acid,	10 drachms.

Dissolve.

Oleate of Atropia.

Take of Atropia,	3 to 15 grains.
Oleic Acid,	10 drachms.

Dissolve.

These oleates will serve for the preparation of ointments, solidifying them with either stearic acid or a mixture of stearic and margaric acids, as wax or suet, will not answer, as they precipitate the alkaloids. Stearic and margaric acids, (such as are used for candles,) will, when melted, dissolve the vegetable bases, of which the following examples may be given.

Oleic Ointment of Quinia.

Take of Sulphate of Quinia,	a drachm.
Oleic Acid,	7½ drachms.
Stearic Acid, (of candles,)	2½ drachms.

Fuse and dissolve.

Oleic Ointment of Veratria.

Take of Veratria,	six grains.
Oleic Acid,	six drachms.
Stearic Acid,	two drachms.

Fuse and dissolve.

Oleic acid is also as good a solvent as the oils for resinous matters and the volatile oils, and having the faculty, also, of dis-

solving the organic bases and their salts, it will replace them in the preparation of narcotic oils, and particularly the *Baume Tranquille*, which I have made with much success with oleic acid.

Varieties.

On Perfumery. By Septimus Piesse.

Continued from page 564.

PERFUMES OF ANIMAL ORIGIN.

In the previous articles we have only spoken of the odors of plants; we now enter upon those materials used in perfumery of an animal origin. The first under our notice is—

Ambergris.—This substance is found in the sea, floating near the islands of Sumatra, Molucca and Madagascar; also on the coasts of America, Brazil, China, Japan and the Coromandel. The western coast of Ireland is often found to yield large pieces of this substance. The shores of the counties of Sligo, Mayo, Kerry, and the isles of Arran, are the principal places where it has been found. In the "Philosophical Transactions" there is an account of a lump found on the beach of the first-mentioned county, in the year 1691, which weighed 52 oz., and was bought on the spot for 20*l.*, but which afterwards was sold in London for more than 100*l.* (Philos. Trans., No. 227, p. 509.) We are quite within limit in stating that many volumes of matter concerning the origin of ambergris have been written, but the question respecting it is still at issue. It is found in the stomachs of the most voracious fishes, these animals swallowing, at particular times, everything they happen to meet with. It has been particularly found in the intestines of the spermaceti whale, and most commonly in sickly fish, whence it is supposed to be the cause or effect of the disease.

Some authors, and among them Robert Boyle, considers it to be of vegetable production, and analogous to amber; hence its name amber*gris*, (grey) grey amber. It is not, however, within the province of these articles to enter into any dissertation of the various theories about its production, which, were it of any importance, could probably be satisfactorily explained if our modern appliances were brought to bear upon the subject. The field is open to any scientific enthusiast; all recent authors mentioning it, merely quoting the facts known more than a century ago.

A modern compiler, speaking of ambergris, says, "It smells like dried cow-dung." Never having smelled the latter substance, we cannot say whether Mr. Redwood's simile be correct, but we certainly consider that

its perfuming value is most incredibly overrated; nor can we forget that Homberg found that "a vessel in which he had made a long digestion of the human fæces had acquired a very strong and perfect smell of ambergris, insomuch that any one would have thought that a great quantity of essence of ambergris had been made in it. The perfume (*odor!*) was so strong that the vessel was obliged to be moved out of the laboratory." (Mem. Acad. Paris, 1711.)

Nevertheless, as ambergris is extensively used as a perfume; in deference to those who admire its odor, we presume that it has to many an agreeable smell.

Like bodies of this kind undergoing a slow decomposition and possessing little volatility, it, when mixed with other very fleeting scents, gives permanence to them on the handkerchief, and for this quality the perfumer esteems it much.

Essence of Ambergris.

Rectified spirit	1 gallon.
Ambergris	6 ounces.

After standing together for three weeks or a month, it is fit to strain off. This essence of ambergris thus made is not sold retail; it is only kept for mixing when the retailed has to be sweetened up to the public nose; it is then called after the Parisian name

Extrait d'Ambre.

Espirit de rose triple . . .	½ pint.
Extract of ambergris . . .	1 pint.
Essence of musk . . .	¼ pint.
Extract of vanilla . . .	2 ounces.

This perfume has such a lasting odor, that a handkerchief being well perfumed with it, will still retain an odor even after it has been washed.

The fact is, that both musk and ambergris contains a substance which clings pertinaceously to woven fabrics, and not being soluble in weak alkaline leys, is still found upon the material after passing through the lavoratory ordeal.

Powdered ambergris is used in the manufacture of cassolettes—little ivory or bone boxes perforated—which are made to contain a paste of strong smelling substances, to carry in the pocket or reticule; also in the making of peau d'espagne, or Spanish skin, used for perfuming writing paper and envelopes, and which will be described hereafter.

Civet.—This substance is secreted by the *Viverra civetta*, or civet cat. It is formed in a large double glandular receptacle between the anus and the pudendum of the creature. Like many other substances of Oriental origin, it was by the enterprise of the Dutch first brought to this country.

When the civet cats are kept in a state of confinement, which at one time was common in Amsterdam, they are placed in strong cages, so constructed

as to prevent the animal from turning round and biting the person employed in collecting the secreted substance. This operation is said to be performed twice a week, and is done by scraping out the civet with a small spoon; about a dram at a time is thus obtained. A good deal of the civet now brought to European markets is from Calicut, capital of the province of Malabar, and from Bassora on the Euphrates.

In its pure state, civet has, to nearly all persons, a most disgusting odor; but when diluted to an infinitesimal portion, its perfume is agreeable. It is difficult to account for the reason why the same substance, modified only by the quantity of matter presented to the nose, should produce an opposite effect on the olfactory nerve; but such is the case with nearly all odorous bodies, especially with essential oils, which, if smelled at, are far from nice, and in some cases positively nasty—such as oil of neroly, oil of thyme, oil of patchouly; but if diluted with a thousand times its volume of oil, spirit, &c., then their fragrance is delightful.

Otto of rose to many has a sickly odor, but when eliminated in the homœpathic quantities, as it rises from a single rose bloom, who will not admit that "the rose is sweet?" The odor of civet is best imparted, not by actual contact, but by being placed in the neighborhood of absorbent material; thus, when spread upon leather, which, being covered with silk and placed in a writing-desk, perfumes the paper and envelopes delightfully, and so much so, that they retain the odor after passing through the post.

Extract of Civet is prepared by rubbing in a mortar one ounce of civet with an orris-root powder, or any other similar material that will assist to break up or divide the civet; and then placing the whole in a gallon of rectified spirits; after macerating for a month, it is fit to strain off. It is principally used as a "fixing" ingredient, in mixing essences of delicate odor. The French perfumers use the extract of civet more than English manufacturers, who seem to prefer extract of musk. From a quarter of a pint to half a pint is the utmost that ought to be mixed with a gallon of any other perfume.

Castor is a secretion of the *Castor fiber*, or beaver, very similar to civet. Though we have often heard of its being used in perfumery, we do not personally know that such is the case.

Musk.—This extraordinary substance, like civet, is an animal secretion; it is contained in excretory follicles about the navel of the male animal. In the perfumery trade these little bags are called "pods," and as imported it is called "pod musk." When the musk is separated from the skin or sack in which it is contained, it is then called "grain musk."

The musk deer (*Moschus moschiferus*) is an inhabitant of the great mountain range which belts the north of India, and branches out into Siberia, Thibet and China. It is also found in the Altaic range, near Lake Baikal, and in some other mountain ranges, but always on the line of perpetual snow. It is from the male animal only that the musk is produced.

It formerly was held in high repute as a medicine, and is still so among Eastern nations. The musk from Boutan, Tonquin and Thibet, is most esteemed, that from Bengal is inferior, and from Russia is of still lower quality. The strength and the quantity produced by a single animal varies with the season of the year and the age of the animal. A single musk pod usually contains from two to three drachms of grain musk. Musk is imported into England from China, in caddies of from 50 to 100 ounces each. When adulterated with the animal's blood, which is often the case, it forms into lumps or clots; it is sometimes also mixed with a dark, friable earth. Those pods in which little pieces of lead are discovered, as a general rule, yield the finest quality of musk; upon this rule, we presume that the best musk is the most worthy of adulteration. Musk is remarkable for the diffusiveness and subtlety of its scent; everything in its vicinity soon becomes affected by it, and long retains its odor, although not in actual contact with it.

It is a fashion of the present day for people to say that "they do not like musk," but, nevertheless, from great experience in one of the largest manufacturing perfumatories in Europe, we are of opinion that the public taste for musk is as great as any perfumer desires. Those substances containing it always taking the preference in ready sale—so long as the vendor takes care to assure his customer "that there is no musk in it."

The perfumer uses musk principally in the scenting of soap, sachet powder, and in mixing for liquid perfumery. The just reputation of Paris's original Windsor soap is due, in the main, to its delightful odor. The soap is, doubtless, of the finest quality, but its perfume stamps it among the *élite*—its fragrance it owes to musk.

The alkaline reaction of soap is favorable to the development of the odoriferous principle of musk. If, however, a strong solution of potass be poured on to grain musk, ammonia is developed instead of the true musk smell.

Extract of Musk.

Grain musk . . .	2 ounces,
Rectified spirit . . .	1 gallon.

After standing for one month, at a summer temperature, it is fit to draw off. Such an extract is that which is used for mixing in other perfumes. That extract of musk which is prepared for retail sale, is prepared thus:—

Extrait de Musc.

Extract of musk (as above) . . .	1 pint.
" ambergris	½ pint.
" rose triple	½ pint.

Mix and filter; it is then fit for bottling.

This preparation is sweeter than pure extract of musk made according to our first formula, and is also more profitable to the vendor. It will be seen hereafter that the original extract of musk is principally used for a

fixing ingredient in other perfumes, to give permanence to a volatile odor. Customers requiring, in a general way, that which is incompatible, namely, that a perfume shall be strong to smell, *i. e.*, very volatile, and that it shall remain upon the handkerchief for a long period, *ergo*, not volatile! Small portions of extract of musk, mixed with esprit de rose, violet, tuberose, and others, do, in a measure, attain this object; that is, after the violet, &c., has evaporated, the handkerchief still retains an odor, which, although not that of the original smell, yet gives satisfaction, because it is pleasant to the nasal organ.

Ammonia.—Under the various titles of "Smelling Salts," "Preston Salts," "Inexhaustible Salts," "Eau de Luce," "Sal Volatile," ammonia, mixed with other odoriferous bodies, has been very extensively consumed as material for pleasuring the olefactory nerve.

The perfumer uses liq. amm. fortis, that is, strong liquid ammonia, and the sesqui-carbonate of ammonia, for preparing the various "salts" that he sells. These materials he does not attempt to make; in fact, it is quite out of his province so to do, but, he procures them ready for his hand through some manufacturing chemist. The best preparation for smelling-bottles is what is termed Inexhaustible Salts, which is prepared thus:—

Liquid ammonia	1 pint.
Essential oil of rosemary . . .	1 drachm.
" " English lavender . .	1 drachm.
" " bergamot . . .	½ drachm.
" " cloves	½ drachm.

Mix the whole together with agitation in a very strong and well-stoppered bottle.

This mixture is used by filling the smelling-bottles with any porous absorbent material, such as asbestos, or what is better, sponge cuttings, that have been well beaten, washed, and dried. These cuttings can be procured at a nominal price from any of the sponge-dealers, being the trimming or roots of the Turkey sponge, which are cut off before the merchants send it into the retail market. After the bottles are filled with the sponge, it is thoroughly saturated with the scented ammonia, but no more is poured in than the sponge will retain, when the bottles are inverted; as if by any chance the ammonia runs out and is spilt over certain colored fabrics, it causes a stain. When such an accident happens, the person who sold it is invariably blamed.

When the sponge is saturated properly, it will retain the ammoniacal odor longer than any other material; hence, we presume, bottles filled in this way are called "inexhaustible," which name, however, they do not sustain more than two or three months with any credit; the warm hand soon dissipates the ammonia under any circumstances, and they require to be refilled.

For transparent colored bottles, instead of sponge, the perfumers use what they call insoluble crystal salts (sulphate of potass). The bottles

being filled with crystals, they are covered either with the liquid ammonia, scented as above, or with alcoholic ammonia. The necks of the bottles are filled with a piece of white cotton, otherwise, when inverted, from the non-absorbent quality of the crystals, the ammonia runs out, and causes the same complaint to be made. The crystals look prettier in colored bottles than the sponge; but in plain bottles the sponge appears quite as handsome, and, as before observed, it holds the ammonia better than any other material. We have also what is called WHITE SMELLING SALTS, and PRESTON SALTS. The White Smelling Salt is the sesqui-carbonate of ammonia in powder, with which is mixed any perfuming essential oil that is thought fit,—lavender oil giving, as a general rule, the most satisfaction.

PRESTON SALTS, which is the cheapest of all the ammoniacal compounds, is composed of some easily decomposable salt of ammonia and lime, such as equal parts of muriate of ammonia, or of sesqui-carbonate of ammonia, and of fresh slaked lime. When the bottles are filled with this compound, rammed in very hard, a drop or two of some cheap essential oil is poured on the top prior to corking. For this purpose, oil of French lavender, or oil of bergamot, answers very well. We need scarcely mention that the corks are dipped into melted sealing-wax, or brushed over with liquid wax, red or black wax dissolved in alcohol, to which a small portion of ether is added. The only other compound of ammonia that is sold in the perfumery trade is eau de luce, though properly it belongs to the druggist. When correctly made—which is rarely, very rarely the case—it retains the remarkable odor of oil of amber, which renders it characteristic.

EAU DE LUCE.

Tincture of benzoin; or, . . .	1 ounce.
" balsam of Peru . .	
Oil of lavender	10 drops.
" amber	5 drops.
Liquor ammonia	2 ounces.

If requisite, strain through cotton wool, but it must not be filtered, as it should have the appearance of a milk-white emulsion.

ACETIC ACID AND ITS USE IN PERFUMERY.—The pungency of the odor of vinegar naturally brought it into the earliest use in the art of perfumery.

The acetic acid, evolved by distillating acetate of copper (verdigris), is the true "aromatic" vinegar of the old alchemists.

The modern aromatic vinegar is the concentrated acetic acid aromatized with essential oils, camphor, &c., thus—

AROMATIC VINEGAR.

Concentrated acetic acid . . .	8 ounces.
Oil of English lavender . . .	2 drachms.
" " rosemary . . .	1 drachm.
" cloves	1 drachm.
" camphor	1 ounce.

First dissolve the bruised camphor in the acetic acid, then add the perfuming oils; after remaining together for a few days, with occasional agitation, it is to be filtered, and is then ready for use.

Several forms for the preparation of this substance have been published, almost all of which, however, appear to complicate and mystify a process that is all simplicity.

The most popular article of this kind is—

HENRY'S VINEGAR.

Dried leaves of rosemary, rue, wormwood, sage, mint, and lavender flowers, each	½ ounce.
Bruised nutmeg, cloves, angelica root, and camphor, each	¼ ounce.
Alcohol (rectified)	4 ounces.
Concentrated acetic acid	16 ounces.

Macerate the materials for a day in the spirit; then add the acid, and digest for a week longer, at a temperature of about 14 c. or 15 c. Finally, press out the now aromatized acid, and filter it.

As this mixture must not go into the ordinary metallic tincture press, for the obvious reason of the chemical action that would ensue; it is best to drain as much of the liquor away as we can, by means of a common funnel, and then to save the residue from the interstices of the herbs, by tying them up in a linen cloth, and subjecting them to pressure by means of an ordinary lemon squeezer, or similar device.

VINAIGRE A LA ROSE.

Concentrated acetic acid	1 ounce.
Otto of roses	½ drachm.

Well shaken together.

It is obvious that vinegars differently perfumed may be made in a similar manner to the above, by using other essential oils in place of the otto of roses. All these concentrated vinegars are used in the same way as perfumed ammonia, that is, by pouring three or four drachms into an ornamental "smelling" bottle, previously filled with crystals of sulphate of potash, which forms "the sel de vinaigre" of the shops; or upon sponge into little silver boxes, called vinaigrettes, from their French origin. The use of these vinegars had their origin in the presumption of keeping those who carried them from the effects of infectious disease, doubtless springing out of the story of the "four thieves' vinegar," which is thus rendered in "Lewis's Dispensatory."

"It is said that during the plague at Marseilles, four persons, by the use of this preservative, attended unhurt multitudes of those that were affected; that under the color of these services, they robbed both the sick and the dead; and that being afterwards apprehended, one of them saved himself from the gallows by disclosing the composition of the prophylactick (a very likely story!!), which was as follows:—

VINAIGRE DES QUATRE VOLEURS, OR FOUR THIEVES' VINEGAR.

Take fresh tops of common wormwood, Roman wormwood, rosemary, sage, mint, and rue, of each	¾ ounce.
Lavender flowers	1 ounce.
Garlic, calmus aromaticus, cinnamon, cloves, and nutmeg, each	1 drachm.
Camphor	½ ounce.
Alcohol, or brandy	1 ounce.
Strong vinegar	4 pints.

Digest all the materials, except the camphor and spirit, in a closely covered vessel for a fortnight, at a summer heat; then express and filter the vinaigre produced, and add the camphor previously dissolved in the brandy or spirit."

A very similar and quite as effective a preparation may be made by dissolving the essential oils of the plants indicated in a mixture of alcohol and acetic acid. Such preparations, however, are more within the province of the druggist than perfumer. There are, however, several preparations of vinegar which are sold to some extent for mixing with the water for lavarotory purposes and the bath, their vendors endeavoring to place them in competition with eau de Cologne, but with little avail. Among them may be enumerated—

HYGIENIC VINEGAR.

Brandy	1 pint.
Oil of cloves	1 drachm.
" lavender	1 drachm.
" marjoram	½ drachm.
Gum benzoin	1 ounce.

Macerate these together for a few hours, then add—

Brown vinegar	2 pints,

and strain or filter, if requisite, to be bright.

TOILET VINEGAR (*à la Violette*).

Extract of cassie	½ pint.
" orris	½ pint.
Esprit de rose triple	½ pint.
White wine vinegar	2 pints.

TOILET VINEGAR (*à la Rose*).

Dried rose leaves	4 ounces.
Esprit de rose, triple	½ pint.
White wine vinegar	2 pints.

Macerate in a close vessel for a fortnight, then filter and bottle for sale.

VINAIGRE DE COLOGNE.

To Eau de Cologne	1 pint.
Add, strong acetic acid	½ ounce.

Filter if necessary.

Without unnecessarily repeating similar formulæ, it will be obvious to

the reader that vinegar of any flower may be prepared in a similar way to those above noticed; thus, for vinaigre à la jasmine, or, for vinaigre à la fluer d'orange, we have only to substitute the esprit de jasmine or the esprit de fluer d'orange, in place of any other odor, to produce orange flower or jasmine vinegars; however, these latter articles are not in demand, and our only reason for explaining how such preparations may be made, is in order to suggest the methods of procedure to any one desirous of making them leading articles in their trade.

We perhaps may observe, *en passant*, that where economy in the production of any of the toilet vinegars is a matter of consideration, they have only to be diluted with rose-water down to the profitable strength required.

Any of the perfumed vinegars that are required to produce opalescence, when mixed with water, must contain some gum resin, like the hygienic vinegar, as above. Either myrrh, benzoin, storax, or tolu, answer equally well.—*Annals of Pharmacy.*

(To be continued.)

On the Action of Gallic and Tannic Acids on Iron and Alumina Mordants. By Prof. Calvert.—The author drew the following conclusions from the facts contained in his communication:—1st, that there can be no doubt that tannic acid is the matter in tanning substances which produces black with iron mordants; 2d, that the reason of gallic acid producing no black die is, that it reduces the peroxide of iron in the mordant, forming a colorless and soluble gallate of protoxide of iron; 3d, that gallic acid has the property of dissolving hydrate of alumina, and also of separating alumina mordants from the cloth on which they are fixed; 4th, that the reason of extracts of tanning matter losing their dyeing properties is, that the tannin is transformed into gallic acid; 5th, that gallic acid possesses the property of dissolving iron, and thus lays claim to the character of a true acid, whilst tannin, not having this action, appears to be in reality a neutral substance. —*Chem. Gaz.*, Nov. 15, 1854, from *Athenæum.*

Viviparous Fish.—Dr. Bennet Dowler has recently discovered in the vicinity of New Orleans a small osseous fish, which proves to be viviparous, having no less than twenty-two well-formed young in its body at the time of examination. Dr. D., however, yields the priority of description to Dr. Gibbons, who found them in California.—*Southern Med. and Surg. Journal.*

Depilatory. By M. Boudet.—

Formula:—Sulphuret of Sodium or Cryst,

Hydro-Sulphate of Soda, . . .	3 parts.
Quick Lime, (powdered) . . .	10 "
Starch, ...	18 "

"Moistened with a little water this becomes so powerful a Depilatory that, if removed in one or two minutes with a wooden spatula, it leaves the

skin quite hairless. Independently of its use in removing abnormal villosity, it is of great serivce in preparing hairy parts for blisters or operations.

It is applicable to the most delicate or irregular surfaces of whatever extent, the hair re-appearing only after several days.—*Georgia Blister and Critic.*

Dupuytren's Pomade for Restoring the Hair.—

℞.	Pulv. Cantharides	1 drm.
	Vin. Sp. Rect.	1 oz.

Macerate 12 days, shaking often and well: then filter.

Rub 10 parts of this Tr. with 60 parts of cold lard, adding Oil Bergamot, or any other perfume, q. s. Rub well into the head night and morning. "In 99 cases out of 100, this application, if continued, will restore the hair."—*Ibid.*

On the action of Citric, Tartaric, and Oxalic Acids on Cotton and Flax Fibres under the Influence of Dry Heat and Pressure of Steam. By Professor Calvert.—The author observed that, when 2 to 4 parts of these acids are dissolved in 100 parts of water, and linen or cotton dipped into the solution obtained, and afterwards dried in the air, they, on exposure to certain temperatures, completely destroy the tenacity of the fibre. This action of organic acids is interesting when it is known that it takes place even at the low temperature of 180°, 212°, and 260° F. He also found that cotton and flax fibres, when prepared as above and then submitted to the influence of steam of 3 lbs. pressure, were destroyed.—*Athenæum.*

Quinic Ether.—A discovery which has lately been made in Italy, and which has excited much attention, is illustrative of the results of perseverance and industry.

In the month of June, 1852, a young man, M. Louis Manetti, a student of the University of Paris, happened to witness the death of a patient with congestive fever, who died apparently from the impossibility of introducing into the system, in a short time, a sufficient quantity of quinine. Manetti was struck with the idea that the principle of the bark might be effectually administered through the medium of pulmonary absorption. Encouraged by Professor Pignacca, Manetti began a series of investigations, the results of which are detailed in a letter from Prof. Pignacca to Dr. Stambio of Milan, a translation of which is found in the "Annales de la Société Medicale de Grande."

Professor Pignacca has called the new agent for inhalation, *Quinic Ether*, probably for want of a better name, for it is not, properly speaking, an ether, and its positive chemical composition is not known. It is a liquid of a special inconstant odor, and is obtained by the distillation of quinate of

lime (*quinate de chaux*) combined with alcohol; and is analogous to the ethereal bodies in general, volatilizing like them.

Professor Pignacca states in his letter that he has administered this fluid by inhalation to eight patients; seven of them had tertian intermittent fever, the last neuralgia of the fifth pair. The neuralgia was of an intermittent type. The remedy acted admirably, both in the cases of fever and in the case of neuralgia.

The quantity of the agent given is about a scruple at a time, repeated three or four times a day. It is administered in the same manner as chloroform, and it produces sensations somewhat similar.—*N. O. Medical News and Hospital Gaz.*

Composition for Dyeing Cotton and Silk Goods of Rose and Purple Colors. By M. MALEGUE.—*Rose Color.* Four ounces of ammoniacal cochineal are dissolved in a quart of hot-water, and the solution boiled for ten minutes, 88 grains of salt of tin, 140 grains of crystals of tartar, 1 ounce of saturated aqueous solution of sulphurous acid, and 140 grains of solution of tin, hereafter described. The whole is boiled for about half an hour, and then allowed to cool in a glass or earthenware vessel, and afterwards decanted into another vessel. Two ounces of the carmine of safranum (extract of safflower), are then added, and well mixed with the solution. A sufficient quantity of the composition is then added to produce the required tint in the goods to be dyed.

Purple Color.—The same process is adopted as for rose color, with the exception that 350 grains of the solution of tin are employed in lieu of 140 grains, and 1¼ ounces of safranum in place of 2 ounces. After having dyed a piece of cloth of six or seven yards length, it is advantageous to add about half an ounce of the extract of safflower.

The 4 ounces of ammoniacal cochineal in the above compositions may be replaced by 3 ounces of ammoniacal cochineal, and 3 ounces of raw cochineal. These two solutions are boiled together in the water for two or three hours, so as to evaporate about one-third part of the water. The other ingredients are then added as before.

The Solution of Tin is prepared by dissolving 5 parts of pure tin in a mixture of 5 parts of nitric acid, and 18 parts of hydrochloric acid, all by weight.

The Salt of Tin is prepared by dissolving pure tin filings or grains in hydrochloric acid, to which has been added one fifth part of its weight of nitric acid, and then evaporating the solution in a water bath, until the salt of tin is obtained in a solid state.

The Ammoniacal Cochineal is prepared by boiling finely-ground cochineal in twice its weight of solution of ammonia, for several hours. The mixture should be well stirred, and when it becomes thick it is placed upon a cloth, which is stretched on a piece of wicker-work, and placed in the stove to dry. The dried mass is then cut or broken into pieces.—*Annals of Pharmacy, Nov.* 2854.

Editorial Department.

UNIVERSAL EXHIBITION OF HUMAN INDUSTRY, TO BE HELD AT PARIS IN 1855. The exhibitions of industry at Paris have heretofore been confined to French products, but the great success of the London universal exhibition, induced the French government to announce, in 1852, that a similarly conducted exhibition would be held three years from that time in Paris, open to all nations. The British government, duly estimating the importance of these international assemblages, has voted $250,000 to defray the expenses of the carriage of the British deposits to and from the port of Havre. The entire space in the apartments devoted to the articles for exhibition is 900,000 superficial feet, of which 150,000, or one sixth, has been allotted to Great Britain and her colonies. The Chemists and Pharmaceutists of London have been moving in the matter since last summer, and have a regularly organized Committee. So far as we are aware, but little interest has been as yet manifested on this side of the ocean, yet much may have been quietly prepared. A commission consisting of Dr. Alfred L. Kennedy, Hon. Jas. Y. McLanahan, Dr. James Swaim, Hon. W. L. Helfenstine, C. L. Ward, Esq., Hon. Jeremiah S. Black, Jno. M. Grier, Esq., Wm. H. Welch, Esq., Pierce Butler, Esq., and Fred. Fraley, Esq., have been appointed by Governor Bigler, on behalf of the State of Pennsylvania.

For the information of our readers, we copy the following from the London Pharmaceutical Journal for September, 1854.

Brief summary of the conditions upon which the exhibition will be conducted.

" 1st. The exhibition will open in Paris on the 1st of May, 1855.

2d. The French Commission will communicate only with exhibitors from foreign countries, through the Commission appointed by each country for that purpose.

3d. No article will be admitted from foreign countries, except with the sanction of such French Commission.

4th. Every article produced or obtained by human industry, whether of Raw Materials, Machinery, Manufactures or Fine Arts, is admissible, except

I. Living animals and plants.

II. Substances liable to become putrid from keeping.

III. Detonating and other dangerous substances.

IV. Articles of extravagant size.

5th. All goods must reach Paris between the 15th of January and the 15th of March, 1855; which period may, in a few exceptional cases, be extended to the 15th of April.

6th. The French Commission offers to convey all goods from the French ports or frontiers to the building in Paris, without charge.

7th. No charge will be made for rent.

8th. Exhibitors and their agents will be admitted free to the building, during the whole period of the exhibition.

9th. Plain counters and partitions will be provided without charges.

10th. The French Commission will find laborers for unpacking, transporting and arranging goods under the direction of exhibitors or their agents.

11th. The French Commission will provide shafting, steam or water presses for machines in motion.

12th. Exhibitors will be responsible for accidents, loss or damage, but the fullest precautions are promised against such events.

13th. The current trade price may be affixed to any goods, if the exhibitors desire it.

14th. Goods may be exhibited in bond, and no duty charged if re-exported.

15th. Exhibited goods, at present prohibited by the French tariff, may be admitted for consumption in France at an *ad valorum* duty of 20 per cent.

16th, Arrangements will be made to insure one year's protection to designs and inventions, if exhibited, without cost to the exhibitor.

17th. The goods will be examined by an international jury, and rewards given, the nature of which will be published."

We presume a commission has been or will soon be appointed by our national government, as the period for receiving the goods at Paris is rapidly approaching. The excellent tendency of these international expositions in the encouragement of commerce and the peaceful arts, and in the promotion of good feeling among distant nations, should induce a strong effort to render them as universal as possible. Our great distance from the point of exhibition, and the scattered state of our population, not to speak of the youthful condition of many of the arts and manufactures here, present obstacles to contributors not felt in European countries, and will probably render the contributions from the United States less interesting as objects of art than for utility.

CANTHARIDES AMONG THE LAWYERS, *or what is the normal per centage of hygroscopic water in Spanish flies?*—It was our *unwilling* lot to witness the proceedings in a recent case tried in the District Court in reference to a lot of cantharides, and a sketch of the facts may not be without use to some of our readers. A——, a powderer, being in want of cantharides, bought a lot of 100 lbs. from B——, a druggist, at $2.70 per lb., without examining them. When A—— received the flies he found them too damp to powder, and gave directions to have them dried on a steam heated surface at 100°

to 120° F., where they laid thirty-six hours, by which they lost sixteen pounds. A—— then informed B—— that his cantharides were damp and unmerchantable, and had to be dried, and as they lost 16 per cent., he claimed an allowance. B—— replied that they were good fresh cantharides, and were as be bought them, and that they must have been over heated or baked, and consequently refused to make a deduction in the price or to take them back, unless they were put in the condition they were in at the time of the purchase. A—— said he would make them as they were when bought, by pouring on 16 lbs. of water, and would return them. B—— replied if returned in that condition he would send them to auction and have them sold on A——'s account. A—— carried out his declaration by watering the flies. B—— had them sold on A——'s account for 106 dollars below cost, which difference B—— claimed of A——, and being refused entered the suit against him.

The questions of fact to be decided were, 1st, What are merchantable cantharides? 2d. Were the cantharides sold by B—— merchantable? 3d. What is the amount of the "natural moisture" of commercial Spanish flies? 4th. Would the heat to which they were subjected injure the flies medicinally? 5th. Would flies with sixteen per cent. of moisture keep without undergoing decomposition?

The witnesses for the prosecution testified to the good quality of the flies at the time they were sold; a specimen of the same lot, kept in a bottle ever since, was exhibited. They believed the loss was occasioned by excessive heat or baking to the damage of the article and not to evaporation of water, and that in sending it to auction they viewed the flies in the light of damaged goods. They therefore claimed a verdict in their favor.

The witnesses for the defendant testified that the flies were quite damp when they were delivered; that they never before had had occasion to dry cantharides previous to powdering them; that the flies were put on the heated surface (the brick work above the boiler) on Saturday, just before the fires were put out, and remained till Monday morning; that when the boilers were in full operation the hand could be borne on the drying surface; that the flies had lost nothing but water, which water had been returned to them, and that they were, to all intents and purposes, as good when they were returned as when received, and he therefore claimed as being free of all obligations in regard to the flies, and asked a verdict accordingly.

In the course of the testimony much was said about the "natural moisture" of cantharides, and it was positively stated that flies with 16 per cent. of moisture would not keep but would putrify, and that that amount of water could only be present by accident or design. The principal witness for the defendant, an experienced druggist, averred that commercial flies never contained more than six per cent. of moisture, that the flies in question were not merchantable, and that the mode of drying them did not injure them.

After the usual display of legal manœuvering, the case was submitted to the jury, who, after being out all night, could not agree, and were discharged. There were several legal technicalities in the case, not reported here, which tended to embarrass the jury.

Now what we wish to point out in reference to this affair is, the want of information manifested by the witnesses and lawyers in reference to the hygroscopic power of organic matter. We were prepared to give the following facts from experiment, but the trial was terminated without our being called to the stand, viz:

100 grains of cantharides that had been two years in a shop bottle, and were partially worm eaten, by exposure for six hours at a temperature of 100° to 120° F., lost 13 grains.

100 grains of the same cantharides, suspended in a large closed jar, containing a little water in the bottom, absorbed 10 grains without exhibiting any moisture on examination.

100 grains of powdered cantharides lost 11 grains when dried as above, and the same powder placed in the closed jar with moist air gained 16 grains.

From these results it is shown that *whole* cantharides may contain 23 per cent. of hygroscopic water, and the powder 27 per cent., without it being visible to the eye or perceptible to the touch, and that the flies in the suit at issue might have contained the amount of water alleged by simple exposure in damp air, without any fraud or ill intent, especially as they were fresh; yet it is highly probable that flies saturated with hygroscopic moisture if kept in tight vessels in warm weather, especially if in powder, would mould and undergo change; in fact we have seen powdered cantharides thus affected, the moisture in which must have been absorbed by accidental exposure after their pulverization.

On the other hand we believe the desiccating process had in no wise injured the flies medicinally, an opinion based on experiment, (see Amer. Jour. Pharm., Vol. xxiv. page 293) but it would have been wiser to have exposed them in a damp atmosphere until they regained the lost moisture by hygroscopic attraction, instead of pouring water on them, which would require a long time to distribute itself equally.

The moral of this transaction points to the necessity of druggists and powderers being acquainted with pharmacology in all its relations; and to the ill results that arise from hasty action on doubtful premises. If the druggist had represented to the powderer the hygroscopic nature of cantharides, and requested him to satisfy himself by experiment, the latter must have been convinced that no fraud existed; that he should have air-dried the flies, and not subjected them to artificial heat; and that if any allowance was to be made for excessive moisture, it must relate only to what was above the normal per centage in fresh flies. The druggist being convinced that *he* was right, should not have taken back the flies, much less resorted to the

censurable course of sending them to auction, which, as the judge charged, was at his own risk, if not agreed to by the opposite party. We believe both parties were well intentioned in the beginning, but both were wrong, both lost their temper, and they should have shared the loss according to their deserts. We were not a little amused at the interest manifested by judge, lawyers, and jury in the subject of litigation, whose reputation for *causticity* appeared to have preceded their introduction to *court*.

Quinologie. Des Quinquinas et des questions qui, dans l'état présent de la science et du commerce, s'y rattachent avec le plus d'actualité; par M. A. Delondre, Pharmacien et Fabricant de Sulphate de Quinine à Graville (Havre;) et par M. A. Bouchardat, Professor d'hygiène à la Faculté de Médecine de Paris, &c. Avec 23 planches. Paris, Germer Bailliere, 1854, quarto, pp. 48.

The work, of which the above is the title page, has just been published, and is unique in its character; differing from the work of Weddell in being more specially devoted to a description of the barks as they occur in commerce, and their relative alkaloidal value, than to their botanical relations and origin.

The first part of the book gives a general historical notice of the investigators of the subject, in which the authors endeavor to do justice to the celebrated Dr. Mutis, of Bogota, whose reputation as a medico-botanical discoverer has greatly suffered from the injustice of his cotemporaries and subsequent writers.

The second part is an episode of the visit of M. Delondre, to the western coast of South America. The name of this gentleman has long been known in connection with the manufacture of quinine, as a member of the old firm of Pelletier, Delondre & Levaillent. On the third of October, 1846, M. Delondre embarked at Bordeaux with apparatus, etc., on a private expedition to Bolivia, with the design of extracting the barks of all qualities, and thus avoid the transportation of a vast bulk of useless material. On his arrival at Valparaiso, he met M. Pinto, the Chief of the Bolivian monopolists, and failed in all his propositions to induce the latter to furnish him with regular supplies of bark, M. Pinto preferring the offers which he had received from a New York house. Soon after, the news of the death of his partner, M. Levaillent, added to his difficulties. In April, 1847, owing to the offers of Messrs. Vincueza and Santo Domingo of Cusco, who agreed to furnish him with 100 serons of bark per month, from the forests of Santa Ana in Southern Peru, he engaged to establish his laboratory at Valparaiso, but he was again disappointed by the failure of these gentlemen to deliver the bark. He then set out on the 1st of July, as a last resort, on a visit to Cusco, to see for himself. Arrived at the latter city, he found M. Vincueza absent in the forest, where he was soon after massacred by the Indians; whilst Santo Domingo, from the chagrin arising from ill success in his mining operations, soon after committed suicide. About this time he met with M. Weddell at Cusco, on his return from the Bolivian forests, and together they set out under the auspices of M. Romainville and an Indian guide, over the Cor-

dillera to the cinchona forests near Cocabambilla, and after inspecting the trees, returned to Cusco. M. Delondre, subsequently at Arequipa, made a new arrangement with M. Braillard, that also fell through, which induced him to re-embark with his apparatus at Valparaiso for Havre, to commence anew the manufacture of quinia, after his chapter of misfortunes.

The third part, which is more particularly interesting to Pharmacologists, is a description of the physical properties and economical chemistry of the principal commercial varieties of cinchona bark, with some hints relative to their botanical origin and commercial history. The chief value of the work consists in the accuracy and beauty with which the several barks have been represented by colored engravings to the number of twenty-three, including several inferior varieties and false barks. These are accompanied by descriptions of the barks and the alkaloidal value of each, based, in many instances, on the results of large operations. These essays are the more interesting, as they chiefly relate to the Columbian or New Grenada cinchonas, and exhibit a very favorable view of their medicinal value as indicated by the proportion of alkaloids. We have condensed them in tabular form, for the benefit of our readers:

Tabular view of the proportion of Alkaloids in the Cinchona Barks, according to the results of M. A. Delondre.

Commercial Varieties.	Locality.	Sulph. quinia yielded by 1000 grains of bark	Sulph. cinchon. yielded by 1000 grains of bark.
Flat Calisaya bark, without epidermis	Bolivia	30 to 32 grs.	6 to 8 grs.
Quilled Calisaya bark, with "	Bolivia	15 to 20 "	8 to 10 "
Flat Carabaya bark, without "	Southern Peru	15 to 18 "	4 to 5 "
Rolled Carabaya bark, with "	" "	8 to 10 "	5 to 6 "
Flat red Cusco bark, without "	" "	4 "	12 "
Rolled red Cusco bark, with "	" "		6 to 8 "
Flat Huanaco bark	Central Peru	6 "	12 "
Pale yellow Huanuco bark, without "	" "	6 "	10 "
Rolled Huanuco bark, with "	" "	2 "	8 to 10 "
Rolled Jaen bark, with "	Northern Peru	10 "	4 "
Bright red bark	Equador	20 to 25 "	10 to 12 "
Pale red bark, rolled	"	15 to 18 "	5 to 6 "
Loxa bark (gris fin condaminea)	"	8 "	6 "
Loxa bark (gris fin negrilla)	"	2 "	10 "
Yellow bark of Guayaquil, without "	"	3 to 4 "	30 "
Rolled Orange yellow bark, or Calisaya of Bogota	New Grenada	18 "	4 to 5 "
	"	30 to 32 "	3 to 4 "
	"	18 "	4 to 3 "
Pitayo bark	"	20 to 25 "	10 to 12 "
Ligneous Carthagena bark	"	20 "	
Orange yellow bark of Mutis, without epidermis	"	15 to 18 "	8 to 10 "
Red bark of Mutis, without epidermis	"	12 to 14 "	6 to 7 "
Yellow bark of Mutis	"	12 to 14 "	6 to 7 "
Rose colored bark	"	18 "	4 "
Maracaybo bark	"	3 to 4 "	10 "
Inferior yellow Cuseo bark	(Peru)	.50 "	
Inferior brown Cusco bark	"	.40 "	
Inferior pale red bark	New Grenada	.18 "	.02 "
White bark	"	.06 "	.12 "

The fourth and last part of the work, which occupies but three pages, consists of practical suggestions in reference to the therapeutic value of cinchona, favorable to its employment. The authors advocate the mixing of the barks in making pharmaceutical preparations. So as to get a due relation of quinia and cinchonia. M. Delondre has been in the habit of preparing a crude quinine, which he calls *Quinium*, by lixiviating a mixture of 3 parts of powdered bark, and one part of lime in powder with alcohol 36° B., and distilling off the alcohol so as to get an extract like the calisaya extract of Mr. Ellis. This extract is suggested as the basis of various preparations, and by knowing the alkaloid value of the several barks, the proportion of them could be so varied as to keep the extract at about the strength of 33 per cent. of alkaloid.

The execution of the plates in the work deserves the highest commendation; so exact are the representations that the several barks may with readiness be recognized, and on these and the practical observations in the text, the merit of the work mainly rests. In a scientific point of view, its claims are but meagre; it does not enter into either the botany, microscopy or abstract chemistry of the cinchonas; yet as the authors lay no claim in that direction, they merit the thanks of pharmacologists for their beautiful and useful addition to the literature of Quinology.

Transactions of the American Medical Association. Instituted 1847. vol. vii., New York. Charles B. Norton, 1854, pp. 661, octavo.

We acknowledge the reception of this volume from the Committee of Publication. In glancing over the minutes of the meeting at St. Louis, we find them so exclusively occupied by strictly medical subjects, that any notice of them would be out of place in this Journal, except the following:

"On motion of Dr. C. B. Guthrie, of Memphis, it was

Resolved, That in the Secretary of the Treasury's recommendation to Congress, to abolish or materially modify the duty on such crude drugs, not producible in this country, as are used in the laboratories of the country, in the manufacture of chemicals, we recognize a wise provision for the future protection of the profession, and the community at large, from impure and sophisticated medicines."

"*Resolved*, That a copy of this resolution be signed by the proper officers of this Association, and be transmitted to the Secretary of the Treasury, and to the Committee of Ways and Means in Congress."

We hope the above resolution will prove influential. The present tariff, in many particulars, tends to discourage the home manufacture of chemicals.

"Dr. Edgar, of St. Louis, offered a resolution, recommending to apothecaries the adoption of labels of particular colors, in order to enable patients and others to distinguish poisonous from other compounds. This was laid on the table."

The course pursued by the Association was certainly the correct one, as any such recommendation would, at best, receive but partial attention, and would be worse than useless unless universally adopted by the apothecaries of each city. The German plan of putting the word poison (gift) on such substances is more feasible.

The President not being in attendance, Dr. Usher Parsons, one of the Vice Presidents, delivered the annual address.

The other principal subjects are the Report of the Committee on Medical Education; Report of the Committee on the Epidemics of Kentucky and Tennessee; on Erysipelas, by R. S. Holmes, M. D., of St. Louis; on the medicinal and toxicological properties of the Cryptogamic plants of the United States, by F. Peyre Porcher, M. D., of Charleston; Report on the Epidemics of Ohio, Indiana and Michigan for the years 1852 and '53; Report on the Epidemics of Louisiana, Mississippi, Arkansas and Texas, in the year 1853; Prize essay on a new method of treating ununited fractures, etc., by David Brainard, M. D., with lithograph plates; Report on the Norwalk disaster; and Dr. Linton's remarks on yellow fever.

Of these papers, the one most interesting to pharmaceutists is the elaborate report of Dr. Porcher on the Cryptogamia of the United States, which extends to 120 pages octavo, and which has occupied the author several years. It is a supplement to the report on the Botany of South Carolina, presented and published in the second volume of the Transactions. In noticing the species, Dr. Porcher gives no botanical description, merely the generic and specific names and the common names, followed by the information he has been able to collect, in reference both to indigenous and foreign species. The genera Agaricus and Boletus are particularly full, and this section will prove serviceable in pointing out the noxious species of the mushroom tribe.

There are many items in this report that would interest our readers, but our space will not admit of their insertion.

The annual publication of reports, on the prevailing diseases of the several districts of the United States, must eventually prove of immense service to the medical profession, in enabling them to generalize more correctly in reference to the causes and treatment of epidemics, and to advocate, with the authority of knowledge, those public hygienic precautions which every community is bound to carry out; but which are too often left untaken until the severity of punishment that follows their neglect compels their effectual adoption.

The Transactions of the Association have heretofore been printed in Philadelphia. Some little feeling was manifested at the St. Louis meeting by the New York members, which resulted in the publication committee being chiefly selected from that city; hence, the present volume is published in New York; it is well printed on good paper, and is, as far as we are able to judge, creditable to the body from which it emanates.

Positive Medical Agents: being a treatise on the new alkaloid, resinoid, and concentrated preparations of indigenous and foreign plants. By authority of the American Chemical Institute. New York: B. Keith & Co., Proprietors and Publishers. Pp. 300.

We have rarely been more puzzled in getting at the true character of a book than has been the case with the one, the title page of which has been given above. Influenced by the title, one would infer that it contained some valuable additions to pharmacy, and to that important part which deals with the isolation and preparation of organic principles and extracts. We can imagine an Eclectic, after having purchased a copy, before glancing over its pages, saying to himself, "now has the Institute, influenced by a generous feeling in favor of suffering humanity, and by that liberal spirit that influences *scientific* bodies, made a full communication of the processes and formulæ of the preparations they claim to manufacture, by which we, who use them, may know what we are prescribing;" but alas! no such good fortune awaits this earnest seeker after knowledge; no such revelation of the profound secrets of New York Eclectic pharmacy was even intended to be made; the book, so far as regards the pharmaceutical aspect of the subject, is an absolute misnomer, and in this regard only is it a proper subject for our criticism.

The first 90 pages, under the caption of "general considerations," which are plausibly written, point to the importance of modifying therapeutics by substituting for crude drugs vegetable principles and other "concentrated preparations," and give an outline of the therapeutical classification or remedies.

The next 130 pages, under the head of "concentrated preparations," give a general account of the medical properties and doses of about thirty-five substances, used by the Eclectic practitioners. One cannot but observe how carefully the term Eclectic is repudiated in this book; indeed, whether used or not, we have not met with it, whilst the preparations noticed are almost exclusively those known as "Eclectic medicines," and which are described, with some exceptions, in the "American Eclectic Dispensatory."

The book being anonymous, the writer does not hesitate to frequently refer to the excellence of the preparations of the "American Chemical Institute," in the light of a disinterested observer, and this, in connection with the fact that it is published by or for that company, has led us irresistibly to the conclusion that the real object of the book is to create a demand for the medicines which, owing to the utter silence of the writer on their mode of preparation, can only be had of the "American Chemical Institute." The author says in the introductory letter:

"With each succeeding edition of this work, we hope not only to give additional descriptions of active concentrated remedies, but the *processes for obtaining those concentrated articles which have been crowded out of this edition, for two reasons*:—1st, we wish the profession to test the value of these medicines; and, 2d, *for want of space in the limits assigned to the first edition.*

We beg to have it distinctly understood that we make no pretensions above others of our profession, and should not at present have thought of publishing this work, had not the *demand for information* relative to the agents prepared at the American Chemical Institute, demanded some work of the kind."

And yet the very information which the writer admits is wanted is withheld, as the medical properties and uses of the plants and the medicines they yield are described in the Eclectic journals and medical treatises.

Regarding the value of the medical statements in this book we make no remark; these are beyond our province, yet it must be admitted that the accounts of the virtues and modes of using the several "preparations" is much like those appended to many patent medicines, very full on all points but their composition and preparation. For those, however, who desire information on the medical qualities of the preparations in question, the work before us may prove highly useful, and at the request of the proprietors we state that C. B. Norton, 71 Chamber street, N. Y., is now the publisher.

On the Construction, Organization, and General Arrangements of Hospitals for the Insane. By THOMAS S. KIRKBRIDE, M.D., Physician to the Pennsylvania Hospital for the Insane. Philadelphia: Lindsay & Blakiston, 1854. pp. 80, octavo.

The position of the author in the admirably conducted institution for the insane belonging to the Pennsylvania Hospital, gives his opinions and views in reference to the details necessary for the comfort and restoration of the insane in the construction and management of hospitals, great weight; and the volume now referred to cannot but prove useful in view of the increasing interest which is being manifested towards the unfortunate class who are the inmates of these institutions, by our State Governments.

Plantæ Heermannianæ. Descriptions of New Plants, collected in South California by DR. A. L. HEERMANN, Naturalist attached to the Survey of the Pacific Railroad route, under Lieut. R. S. Williamson, U.S.A. *With remarks on other Plants heretofore described and belonging to the same collection.* By E. DURAND and THEOD. C. HILGARD, M.D.

We acknowledge the receipt of the above from the authors.

CATALOGUE OF THE CLASS OF THE PHILADELPHIA COLLEGE OF PHARMACY,

AT THE THIRTY-FOURTH SESSION, 1854-55.

The names of preceptors indicated in the second column, are those with whom the students now are; in several instances, they have been with others for longer or shorter terms. The third and fourth columns indicate the places from whence the students come.

Matriculants.	Preceptors.	Town or County.	State.
Armstrong, James A.		Philadelphia,	Pennsylvania.
Bakes, W. C.	Durand & Tourtelot,	"	"
Bancroft, Joseph W.	Gilbert, Wentz & Co.	"	"
Bannvart, Charles A.	Fred. Brown,	Paris,	France.
Bassett, William H.	Charles Ellis & Co.	Wilmington,	Delaware.
Beam, Isaac R.	Isaac R. Beam,	Philadelphia,	Pennsylvania.
Biddle, John	Wm. Biddle,	"	"
Brower, Noah B.	A. J. Moloney, M. D.	Norristown,	"
Bucher, Henry F.	C. R. Keeney,	Carlisle,	"
Cadbury, John W.	Charles Ellis & Co.	Philadelphia,	"
Campbell, Charles L.	William P. Troth & Co.	"	"
Campbell, John	John Murray,	Turella,	Scotland.
Campbell, Samuel	H. C. Blair.	Philadelphia,	Pennsylvania.
Carroll, Augustus D.	Charles Ellis & Co.	Wheeling,	Virginia.
Chenoweth, John T.	Charles S. Rand,		Kentucky.
Chapin, Dwight	G. W. Nebinger,	Philadelphia,	Pennsylvania.
Craige, Randolph	Thomas W. Craige, M. D.	"	"
Cummings, Wm. T.	Wm. F. Patterson, M. D.	"	"
Curry, John L.	Russell & Schott,	"	"
Dickson, John M.	W. Gayley,	"	"
Dilkes, Theodore	H. M. Zollikoffer,	"	"
Douglass, George W.	Thomas P. James,		
Dunton, Jacob	Charles Ellis & Co.	Philadelphia,	Pennsylvania.
Epting, Charles W.	Frederick Klett & Co.	Pottsville,	"
Evans, Jr. William	Wm. Evans,	Philadelphia,	"
Evans, William H.	Henry C. Blair,	"	"
Fairthorne, Robert	B. Ritter,	St. Albans Herts,	England.
Farley, John W.	Dr. J. Wilson Farley,	Philadelphia	Pennsylvania.
Fearing, Henry Martin	Samuel C. Sheppard,	Elizabeth City	N. Carolina.
Fisher, Paul	Wm. King,		Prussia.
Fleming, W. S.	H. C. Blair,	Carlisle,	Pennsylvania.
Frazer, Christian S.	Russell & Schott,	Harrisburg,	"
Gerhart, Herman	John Bley,	Philadelphia,	"
Graham, Isaiah H.	Frederick Brown,	Carlisle,	"
Gray, Albert	Wm. Taylor,	Columbia,	"
Griffith, J. Clarkson	Benjamin J. Crew,	Winchester,	Virginia.
Hallam, Thomas			New Jersey.
Hancock, Charles W.	Charles F. Shrom,	Belmont,	Pennsylvania.
Harte, James Henry	Thomas Gegan,		Ireland.
Higbee, Hugh H.	Charles Shivers,	Moorestown,	New Jersey.
Himes, Thomas J.	T. J. Himes,	Shippenburg,	Pennsylvania.
Hitt, A. J.		Millersburg,	Kentucky.
Hooper, John H.	Gilbert, Wentz & Co.	Cambridge,	Maryland.
Hoffecker, James P.	Tristam Needles,	Smyrna,	Delaware.
Hazelton, William	French & Richards,		New Jersey.
Jackson, James M.	William P. Troth & Co.	Philadelphia,	Pennsylvania

Kelly, Edward B.	Johnson, Holloway & Cowden	Lebanon Co.	Pennsylvania.
Kearney, Wm. H. Z.	Alfred Wynkoop,	Philadelphia,	"
Kendall, John H.	A. M. Snyder,	Reading,	"
King, Wm. H.	D. & E. Parrish,	Liberty Co.	Georgia.
Kollock, M. Henry	Frederick Brown,	Philadelphia,	Pennsylvania.
Leuchsenring, Hermann,	Bullock & Crenshaw,	Havana,	Cuba.
Lyne, Thomas V.	Charles Ellis & Co.	Portsmouth,	Virginia.
Lawall, Edmund D.	James N. Marks,	Allentown,	Pennsylvania.
Leib, H. Clinton	Bullock & Crenshaw,	Philadelphia,	"
Lukens, Edward	Frederick Klett & Co.	Downingtown,	"
Lizé, Alexander	Alfred Tatem,	Rouen,	France.
Leamy, James C.	Thomas Wiegand,	San Francisco,	California.
Massenburg, Thomas L.	Bullock & Crenshaw,	Hampton,	Virginia.
Meyers, Edward S.	Edward B. Garrigues,	Columbia,	Pennsylvania.
McBride, James	E. & C. Yarnall & Co.	Montgomery,	"
McConaughy, A. D.	Thomas Jones,		"
McFee, George W.	John Horn,	Philadelphia,	"
Miles, John Q.	Wm. J. Carter,	"	"
Mittnacht, Henry	Caleb H. Needles,	Baltimore,	Maryland.
Morgan, David U.	George H. Ashton,	Philadelphia,	Pennsylvania.
Merritt, Alfred C.	Browning & Bro.	Salem,	New Jersey.
Neal, Leander	Samuel Simes,	Philadelphia,	Pennsylvania.
Noble, Thomas	James Bond,	"	"
Page, S. Davis		San Francisco,	California.
Pancoast, Dillwyn P.	Joseph C. Turnpenny,	Mullica Hill,	New Jersey.
Pedrick, Charles W.	Joseph A. McMakin,	Portsmouth,	Virginia.
Penrose, Thomas N.	J. R. Angney, M. D.	Philadelphia,	Pennsylvania.
Perot, E. L.	Charles Ellis & Co.	"	"
Perrot, E. Raphael	Wm. M. Reilly,	Paris,	France.
Pratt, Wm. H.	Wm. Hodgson, Jr.	New Haven,	Connecticut.
Reichart, J. E.	George C. Bower,		
Rosengarten, Harry B.	Rosengarten & Sons,	Philadelphia,	Pennsylvania.
Robbinz, Alonzo	John W. Simes & Son,	"	"
Stevens, J. Blackford	C. Ellis & Co.	Madison,	Indiana.
Scattergood, George J.	C. Ellis & Co.	Philadelphia,	Pennsylvania.
Shick, Andrew J.	Bullock & Crenshaw,	"	"
Siddall, Frank H.	John C. Baker & Co.	"	"
Steel, Wm. H.	George H. Ashton	"	"
Steever, Mark R.	William P. Troth & Co.	"	"
Stockdell, Hugh		Petersburg,	Virginia.
Stokes, Joseph C.	Higbee & Stokes,	Moorestown,	New Jersey.
Sickels, John W.	Thomas S. Kirkbride, M. D	Utica,	New York.
Taylor, Joseph A.	Ambrose Smith,	Philadelphia,	Pennsylvania.
Taylor, Horace B.	D. & E. Parrish,	"	"
Thorne, William H.	Johnson, Holloway & Cowden	Palmyra,	"
Thompson, William	J. Weber,	Liverpool	England.
Verner, Chittick	Dr. Jas. Cornick, U. S. N.		Ireland.
Weaver, J. Thornton	Henry A. Bower,	Philadelphia,	Pennsylvania.
Weaver, Thomas	D. & E. Parrish,	"	"
Wetherill, J. Bloomfield	Thomas P. James,	"	"
Wenzell, Wm. T.	Dr. W. P. Vasey,	St. Louis,	Missouri.
Wilson, Adam H.	John Moffet,	Philadelphia,	Pennsylvania.
Wilson, Henry M.	Wm. T. Taylor, M. D.	Holmesburg,	"
Young, Joseph E.	William Procter, Jr.	Philadelphia,	"
Zieber, Jacob B.	Samuel Chamberlain,	Reading,	"